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Infantry Training

Volume I

INFANTRY PLATOON WEAPONS PROVISIONAL PAMPHLET FOR THE GENERAL PURPOSE MACHINE GUN 1962

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*Prepared under the direction of
The Chief of the Imperial General Staff.*

THE WAR OFFICE,
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(See catalogue of War Office Publications, Part II)

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TECHNICAL DETAILS

Calibre	7.62 mm.
Length of Gun	49½ inches
Length of Barrel	24.87 inches
Weights Gun	...	...	...	...	...	...	24 lbs.
" Tripod—SF Role	...	...	...	...	...	...	30 lbs.
" Barrel—Light	...	...	...	...	...	...	6 lbs. 1 oz.
" Barrel—Heavy	...	...	...	...	...	...	7 lbs.
" 200-Round Belt	...	...	...	...	...	...	12 lbs.
No. of Grooves	...	...	...	...	...	...	4
Twist of Rifling	...	...	...	...	...	...	Right Hand
Type of Sights: Rear	...	...	...	...	...	...	Aperture
Fore	...	...	...	...	...	...	Blade
Sight Range	...	...	...	...	...	...	200 to 2,000 yards
Sight Base: SF Role...	...	...	...	...	...	...	31 inches
LMG Role	...	...	...	...	...	...	33½ inches
System of Operation	...	...	...	...	...	...	Gas and Recoil Buffer
Cyclic Rate of Fire	...	...	...	...	...	...	600 to 1,000 RPM

Safety precautions

1. (a) Before a lesson begins, make certain that all guns are unloaded. Inspect all rifles, gun boxes, drill cartridges and pointers to ensure that no live ammunition is present.
- (b) Whenever the top cover is opened, it is important that no firing is the action is cocked and the trigger pressed. This ensures that the actuating stud on the breech block is positioned correctly in the channel of the feed arm and is therefore not left under compression.

Notes

2. (a) The gun is simple to work, so have your working smooth.
- (b) Name parts as you handle them, but do not waste time trying to get the squad to learn them. They will get to know them as they work and handle the gun during later lessons.
- (c) Sorting and cleaning should be done with minimum fuss. Do not waste more time.

THE 7.62 MM GENERAL PURPOSE MACHINE GUN

INTRODUCTION

Aim of this pamphlet

1. The aim of this pamphlet is to provide those who are charged with the teaching of the GPMG with sufficient material to train and exercise troops in the elementary and minor tactical handling of the weapon.

Layout

2. The pamphlet is in three parts:—

- Part I—The Light Machine Gun Role
- Part II—Fire Control
- Part III—The Sustained Fire Role

The lessons are set out in instructional form, but instructors must also look for guidance to the pamphlet, *The Principles of Successful Instruction*, 1951.

Safety precautions

3. (a) Before a lesson begins, make certain that all guns are unloaded. Inspect all belts, belt boxes, drill cartridges and pouches to ensure that no live ammunition is present.
- (b) Whenever the top cover is opened, it is important that on closing it the action is cocked and the trigger pressed. This ensures that the actuating stud on the breech block is positioned correctly in the channel of the feed arm and is therefore not left under compression.

Notes

4. (a) The gun is simple to teach, so keep your teaching simple.
- (b) Name parts as you handle them, but do not waste time trying to get the squad to learn them. They will get to know them as they strip and handle the gun during later lessons.
- (c) Stripping should always be done with reasonable care. Do not strip against time.

PART I—LIGHT ROLE

CHAPTER 1—INSTRUCTIONAL LESSONS

LESSON 1—INTRODUCTION, STRIPPING AND ASSEMBLING

Aim

5. To teach stripping and assembling.

Stores required

6. Guns, belts, wallet.

Introduction

7. Explain:—

(a) The 7.62 mm machine gun is designed for general purposes: it may be used either as a light machine gun fired from a bipod, or be fired from a tripod and used in the sustained fire role.

(b) It is a fully automatic, belt fed, gas operated weapon, capable of a sustained high volume of fire in bursts. It is simple and sturdy in construction, easy to learn and fire. Stoppages are rare and can be easily and quickly remedied.

(c) The weapon is air cooled. In the LMG role the light barrel is used. This is chromed internally to reduce wear. In the sustained fire role there are two heavy barrels. These barrels are lined internally to reduce wear due to overheating, thus allowing the use of a high rate of fire. When inspecting heavy barrels it will be noticed that there appears to be a crack about six inches from the breech end. This is the forward end of the liner.

(d) The belts are of disintegrating links, factory filled, and will be packed in 200-round belt boxes; thus the ammunition is kept clean and dry until required.

(e) The maximum range in the LMG role when fired from the bipod is 800 metres. Used in the sustained fire role the maximum range is 2,000 metres.

(f) Flash is reduced to a minimum by means of a flash hider and a specially designed gas regulator.

(g) All zeroing devices are on the foresight.

To strip the butt and recoil mechanism

8. As parts are stripped they should be put in a clean place, and care must be taken that they do not become lost or damaged.

9. Explain and demonstrate:—

(a) Safety precautions

Open the cover by pushing in the cover catches, cock the gun by pulling the cocking handle fully to the rear; lift the feed tray. Inspect the breech and body to ensure they are clear, close the cover. Hold the cocking handle, press the trigger and allow the working parts to go forward under control. Close the ejection opening cover, unless stripping is to follow at once.

(b) The butt

Having made sure that the working parts are forward, hold the pistol grip with the left hand, grip the butt with the right hand close to the body and with the forefinger press up on the butt catch; lift the butt upwards until clear of the body.

(c) Recoil mechanism

With the thumb of the right hand, push the rear of the return spring rod slightly forward and upward. This disengages the stud on the rod from the keyhole-shaped slot in the body and allows the return spring and rod to be withdrawn by pulling to the rear. To remove the piston and breech block, place the left hand behind the gun body and with the right hand pull the cocking handle sharply to the rear. The piston and breech block will now protrude from the body and can be drawn clear. Push the cocking handle forward. The light barrel is numbered to the body. Breech blocks and pistons are numbered to each other, but are not numbered to the body.

To assemble

10. (a) Recoil mechanism

Hold the body of the gun with the left hand, guide the piston into the lower part of the body. At the same time ensure that the breech block is held fully forward and up. Position the breech block into its guides in the upper part of the body; press the trigger and push the piston group fully forward. Insert the plain end of the return spring assembly and ensure that the stud on the rod is correctly engaged in the slot in the body of the gun.

(b) Butt

Lift the gun slightly, position the forward end of the butt into its guides in the body and press down until the catch is engaged.

(c) Testing

Always after assembly test the gun for correct assembly by cocking the gun and pressing the trigger with the recoil mechanism under control. Close the ejection opening cover.

11. Practise the squad. Leave recoil mechanism stripped.

To strip the breech block

12. (a) Push the breech block to its forward position on the piston. Using the nose of a drill round, push out the link pin and remove the breech block. Withdraw the firing pin from the rear of the breech block.

(b) The extractor and spring

The tool for removing extractor is carried in the handle of the gas regulator cleaning tool.

- (i) Hold the breech block with the extractor upwards; lift the locking lever until it is upright.
- (ii) Insert the thin end of the tool into the recess in the extractor plunger; position the other end into the slot in the locking lever.
- (iii) Hold the tool down firmly with the thumb of the left hand and rotate the locking lever downwards—thus compressing the extractor spring.
- (iv) Lift out the extractor and slowly ease the locking lever upwards until there is no tension on the extractor spring; remove the tool and pull out the extractor plunger and spring. Great care must be taken that the thumb does not slip from the tool or the extractor plunger and spring may be lost. The extractor will only be removed for cleaning after firing.

(c) To assemble the extractor and spring

Replace the extractor plunger and spring. Insert the thin end of the tool removing extractor into the recess of the plunger, lift up the locking lever and hook the other end of the tool as for stripping. Force the locking lever down to compress the extractor spring. Insert the extractor into its seating, then raise the locking lever. Remove the tool, replace it in its container and pack away into the spare parts wallet.

(d) Breech block

Check that the numbers on the breech block and piston agree. Insert the head of the firing pin into its recess and slide the breech block on to the firing pin, lift the link and insert the link pin.

13. Practise squad. After practice, leave the gun assembled.

To strip the barrel group

14. (a) Barrel

First cock the gun to prevent damage. To remove the barrel keep the gun upright; rotate the carrying handle upwards until the catch engages with the barrel locking nut. Press the insulated thumb piece and raise the carrying handle to a vertical position; push the barrel forward and lift off.

(b) Gas regulator

With the barrel removed from the gun, unscrew the gas regulator anti-clockwise until free. During the early stages of removal lift the indicator over the stop of the regulator sleeve. Before removing it put one hand under the regulator to prevent losing the split collars. If these do not fall off when the regulator is removed, take them off and put them down where they cannot be lost. Push the plug on the regulator seating to the rear and remove.

To assemble

15. (a) The gas regulator

Insert the plug into the regulator seating, ensuring that the flat surface is in line with its seating. Replace the split collars, fit the regulator from the front and screw fully home. Turn the regulator anti-clockwise to the largest number giving reliable functioning. This is normally No. 7.

(b) Barrel group

Check that the numbers on body and barrel agree. With the gas regulator downwards and carrying handle upwards, put the barrel on to the barrel support on the top of the bipod; keeping the gun upright, draw the barrel to the rear and lower the carrying handle firmly. To raise the carrying handle for the purpose of carrying the gun, lift up the release catch.

- (c) When the barrel has been assembled, ease the working parts forward and close the ejection opening cover.

16. Practise the squad.

To strip the trigger group

17. Remove the rear mounting pin. With the working parts forward, remove the retaining pin from the rear of the trigger group by pushing out the centre pin from one side and the retaining pin from the other. Remove the trigger group by pivoting the grip slightly downward. The trigger group will not be removed from the gun except for cleaning after firing.

To assemble

18. Check that the safety catch is at "F". Insert the recess on the front of the trigger group into its seating and, holding it forward, lift the rear of the group upwards. Replace the centre pin and the locking pin.

19. Practise the squad.

Conclusion

20. Questions from and to the squad.

21. Sum up. Remind the squad that care must be taken at all times when stripping and assembling.

NEVER strip any part unless the gun is unloaded.

LESSON 2—CLEANING

Aim

22. To teach how the gun is cleaned DAILY, BEFORE, DURING and AFTER FIRING under both normal and adverse conditions.

Stores

23. Guns, drill belts, wallets, oil and cleaning materials.

Instructor's notes

24. During instruction on this lesson members of the squad must be made to copy the actions of the instructor in the various phases of preparation and cleaning of the gun. Practice in cleaning should be carried out at the end of each type of cleaning. If time does not permit this, questions should be asked during pauses at the conclusion of each phase of the lesson.

Preliminaries

25. Safety precautions. Revise stripping and leave the gun stripped, except for the extractor and trigger group.

Approach

26. Stress the importance of correct cleaning, particularly the maintenance of the gun during firing.

Cleaning material and spares

27. Explain and demonstrate:—

Each gun has a wallet containing the following items:—

Oil can

Rod cleaning—five piece

Brush cleaning bore

Brush cleaning chamber

Brush cleaning cylinder

Cleaner gas ports

Clearing plug

Firing pin

Tool adjusting foresight and removing extractor

Extractor, stay and spring

Link pin

Two split collars

Tool cleaning gas regulator.

Daily cleaning

28. (a) Assemble the jointed cleaning rod and, using a piece of flannelette 4×2 inches, clean out the bore of the barrel. Inspect to make sure it is clean. Always insert the rod from the chamber end and make certain that the rod does not rub against the chamber opening.

(b) Assemble the chamber cleaning brush to the rod and clean out the chamber.

(c) Oil the barrel, using flannelette 4×1½ inches.

(d) Clean and oil the flash hider.

(e) Wrap a piece of flannelette 4×6 inches round the cylinder brush, join the brush to the rod and clean out the cylinder from the front end. Inspect and oil, using flannelette 4×4 inches in the rod eyelet.

(f) Clean the rest of the gun with an oily rag.

(g) Assemble the gun and test the recoil mechanism.

(h) Clean and check spare parts; repack.

29. Practise the squad.

30. Explain that to ensure correct functioning the gun must be clean and the gas regulator adjusted correctly, so that the gun fires at a rate of about 750 rounds per minute.

Cleaning before firing

31. To prepare the gun for firing:—

(a) Strip the gun as for daily cleaning.

(b) Slide back the dust cover and thoroughly clean the guide ribs, then lightly oil the ribs. Slide the dust cover forward.

(c) Clean the remainder of the gun and leave dry.

(d) Replace the barrel.

Lubricating

32. (a) As the gun is assembled, oil only the following parts:—

(i) The bearing surfaces of the breech block and piston extension.

(ii) The grooves in which all guide ribs work.

(iii) Locking lever and locking shoulder.

(iv) The feed arm, especially the channel in which the actuating stud moves.

(v) The return spring and butt catch.

(vi) The trigger mechanism. Ensure that the safety catch is at "F" before assembly of the breech block and piston in gun.

(b) The exterior of the gun should be dried, especially the barrel and gas affected parts.

(c) When the gun has been assembled, press the trigger and, keeping it pressed, move the cocking handle backwards and forwards a few times.

Adverse conditions

33. (a) When preparing the gun for firing in ADVERSE CONDITIONS, e.g., sand or arctic, the gas regulator will be adjusted for maximum gas.

(b) Oil for use in extreme arctic cold conditions will be issued as and when necessary.

Examination

34. When the gun has been prepared for firing the following parts must be examined:—

- Ensure that the gas regulator is at the correct setting for the conditions under which the gun is to be fired.
- Ensure that the barrel is locked firmly in position.
- Check the sights for tightness.
- Ensure there is sufficient oil and cleaning materials.
- Check and repack the wallet.

Care during firing

35. Every opportunity must be taken to clean, examine and oil the gun during lulls in firing. Special attention should be given to the chamber and gas affected parts. If time permits the breech block and piston should be removed, all fouling wiped off and then re-oiled as before. If this is not possible, open the cover and squirt a few drops of oil on the locking levers, guide ribs and primary extraction face.

Piston and cylinder cleaning tool

36. Explain and demonstrate:—

- Insert any section of the cleaning rod into the hole in the base of the tool, hold the outer sleeve and pull up on the cleaning rod to withdraw the cutting face of the reamer. Remove the cleaning rod.
- To clean the piston head insert the cleaning tool into the piston recess and rotate the tool clockwise until the shoulder of the tool contacts the piston face.
- Insert the cleaning rod and, applying pressure on the rod, rotate the tool until the cutting edge of the reamer is fully extended and all fouling is removed.
- To withdraw the reamer, place the thumb on the base of the tool, raise the cleaning rod and remove the tool.

37. Practise the squad.

38. Explain and demonstrate:—

- To clean the front end of the cylinder, insert one section of the cleaning rod as taught and withdraw the inner member of the tool.
- Insert the tool into the cylinder so that the shoulder comes into contact with the cylinder face.
- Apply pressure on the cleaning rod and rotate in a clockwise direction until the reamer is fully extended and all fouling is removed.
- Retract the reamer as taught and remove the tool.

39. Practise the squad.

Cleaner gas ports

40. Explain and demonstrate:—

- There are three sizes of gas ports and gas escape holes. These are cleaned by using the gas port reamers. The reamers are numbered 1 to 3.
- No. 1 is used to clean out the holes in the cylinder. No. 2 is used for the holes in the gas regulator and gas block. No. 3 is used for the large hole in the gas block.
- The cleaner gas regulator is used to clean out the rear of the regulator sleeve. It is also used as a scraper to clean the cannellure of the regulator sleeve.

41. Question and practise the squad.

Cleaning after firing

42. (a) Strip the gun as taught in Lesson 1.

- Use only the materials issued. NEVER use emery or other abrasive to clean the gun. The chamber and bore of the barrel can easily be kept clean by the brush, oil and flannelette provided.
- The gun is easier to clean immediately after firing whilst still warm, but if this is not possible, thoroughly oil all gas affected parts; this will greatly assist in cleaning later.
- The barrel. Join up the cleaning rod and clean the barrel with oily flannelette $4 \times 1\frac{1}{2}$ inches, then dry. If all signs of fouling are removed, leave it. If hard fouling is still present, attach the bore cleaning brush, oil it and insert it at the chamber end; rub through vigorously a few times, then dry the bore and again inspect. Repeat if still not clean.
- Fit the chamber cleaning brush to the rod and clean the chamber.
- Clean the outside of the barrel, remove all fouling from the gas regulator, using correct sized reamers, and clean the inner surfaces with the tool provided.
- The body group. Clean the cannellure and gas escape holes at the front of the cylinder with the cleaning tools provided. Clean the gas cylinder with the oiled cylinder brush fitted to the cleaning rod. Dry out with a piece of flannelette wrapped round the brush. Clean the rest of the body, especially the guide grooves and feed mechanism. Open the dust cover and clean the guide ribs. Close the dust cover.
- The piston group. Clean thoroughly the face of the breech block; clean the piston head with the tool provided.

(j) Oil the parts and assemble the gun.

(k) Check and clean all spares.

Care of weapon after firing

43. Normal conditions

(a) The bore, chamber, piston and other gas affected parts must be thoroughly cleaned, inspected and re-oiled for several days after firing.

(b) In very dusty conditions guns must be dry cleaned and inspected daily. If oil has to be used to remove rust, use it sparingly and remove all traces of oil when clean.

44. Adverse conditions

(a) *Damp, humid conditions*

In these conditions clean as taught but inspect more frequently; watch for rust and keep all parts oily.

(b) *Desert conditions*

It is important that under extreme dusty and sandy conditions the whole of the gun is wiped dry. The gun should be dried by sweating the parts in the sun, constantly wiping off the exuding oil. Cleaning brushes should be washed in soap and water and dried before use. As the weapon is dry, frequent inspection for rust is essential. If oil is used to remove rust, that part must again be completely dried.

(c) *Arctic cold*

When the weather is so cold that normal lubricating oil freezes, remove that type of oil and replace with low cold tested oil which does not freeze.

Conclusion

45. Questions from and to the squad.

46. Sum up. Remind the squad that care must be taken when cleaning and preparing the gun, particularly under adverse conditions.

LESSON 3—MECHANISM

Aim

47. To teach how the gun works.

Stores

48. Guns, belts, drill rounds and empty case.

Notes

49 Explain and demonstrate each phase and then ask questions on it.

Preliminaries

50. Safety precautions. Remove recoil mechanism and trigger group.

Approach

51. If you understand the mechanism of the gun you will find it easier to understand stoppages and put them right.

How the gun works

52. The gun is loaded by hand and cocked. When the round is fired the gas drives the piston group to the rear, ejecting the empty case. The return spring and buffer drives the piston forward, loading a fresh round, which is then fired. This action goes on as long as the trigger is kept pressed and there are rounds in the belt.

Detailed mechanism

53. *Actions on cocking the gun*

(a) When the gun is cocked the piston and breech block are pulled to the rear and the following action takes place. A stud on the inside of the cocking handle slide engages in a recess on the piston extension. During its backward action the rear end of the piston compresses the return spring and telescopic rod. The projection on the ejection opening cover is depressed by the piston extension and the ejection opening cover is opened under pressure of its spring.

(b) Immediately the piston begins to move to the rear the firing pin, held by its rear end in the piston extension, is withdrawn into the breech block.

(c) The locking link is rotated forward and upward on its axis, lifting the locking lever from its locked position, thus unlocking the breech.

(d) When the working parts are fully to the rear the sear rises and engages with the bent on the underside of the piston extension.

Note:—The cocking handle must always be pushed fully forward after cocking the gun.

54. Question the squad.

Action of the feed

55. (a) When the gun is ready to fire, the first round is positioned in line with the chamber and held in position by the cartridge stop and cartridge guide. The second round in the belt is held by the outer pawls. The actuating roller is engaged in the channel of the feed arm.

(b) On pressing the trigger the nose of the sear is depressed, thus freeing the piston extension and allowing the main spring to push the working parts forward.

(c) The feed horns strike the base of the cartridge and force it out of the link and, assisted by the cartridge guide, feed it into the chamber.

The extractor rides over the base of the round and the ejector is compressed.

56. Question the squad.

Firing action, first round and breech locking

57. As the round is fed into the chamber the locking lever is forced fully down by the locking cams, slowing down the forward movement of the breech block. The piston extension, still moving forward, causes the locking lever link to rotate downward and backward, thus forcing the arms down to their fullest extent in front of the locking shoulder. The round is now fully home with the breech mechanically locked. The final forward movement of the piston and piston extension drives the firing pin through the breech block on to the cartridge cap and fires the round.

58. Question the squad.

Unlocking the breech, extraction and ejection of the empty case

59. (a) When the round is fired some of the gases pass through the gas vent into the gas cylinder and, striking the head of the piston, drive it to the rear.

(b) As soon as the piston begins to move the firing pin is withdrawn. During the primary movement of the piston, i.e., about five-eighths of an inch, the breech remains locked whilst the bullet travels the distance from the gas vent to the muzzle.

(c) Continued movement of the piston causes the locking lever link to rotate forward and upward on its axis, lifting the locking lever out of engagement with the locking cams; the breech block is jerked slightly backwards, effecting primary extraction.

(d) The breech is now fully unlocked. As the breech block starts its backward movement the extractor withdraws the empty case from the chamber. When the case is freed from the chamber the ejector forces it from the face of the breech block out through the ejection slot. The working parts continue to the rear, compressing the return spring and rebounding from the buffer.

60. Sufficient gas should always be made available by gas regulator adjustment to cause the working parts to rebound off the buffer.

61. Question the squad.

Subsequent shots and end of burst

62. (a) As long as the trigger is pressed the sear is held down, allowing the recoil mechanism to automatically feed and fire the subsequent rounds—ejecting the empty cases and the links.

(b) When the trigger is released the pressure of its spring forces the trigger forward, allowing the sear to rise and engage the recoil mechanism, holding it to the rear.

63. Question the squad.

Action of the feed mechanism

64. (a) Forward movement

During the forward movement of the breech block the actuating stud, being engaged in the feed arm, operates the arm and forces it to the right. At the same time the inner pawl, moving to the left, rides over the next round in the belt and engages behind it. The outer pawls at the same time carry the round to the half feed position. At this stage both inner and outer pawls are engaged behind the next round to be fired.

(b) Rearward movement

During the first two inches of rearward travel of the breech block the feed actuating stud operates the front end of the feed arm from right to left. The inner pawl, moving to the right, carries the next round to be fired from the "half-feed" position to the fully fed position. At the same time the outer pawls move to the left and engage behind the next round in the belt.

65. Question the squad.

Action of the trigger mechanism

66. (a) During the backward action the rear under-surface of the piston extension rotates the spring loaded tripping lever and disengages it from the tail of the sear. The nose of the sear rises under the pressure of its spring. It is then momentarily depressed by the piston extension before engaging the belt. During this action the tripping lever is returned to its forward position, ready to engage the tail of the sear when the trigger is pressed.

(b) On pressing the trigger the sear and trigger spring are compressed, the tripping lever is pulled down and the sear actuating bar pushes the tail of the sear upwards until it engages in the upper bent of the tripping lever. At the same time the nose of the sear is depressed, thus freeing the piston extension and allowing the main spring to push the working parts forward.

67. Question the squad.

Action of the safety catch

68. (a) (i) The safety catch is recessed to take a lug positioned on the underside of the sear.

(ii) When the safety catch is put to "F" (Fire), this recess is directly under the sear lug and allows the sear to be operated.

(iii) When the safety catch is put to "S" (Safe), the recess is not in line with the lug, thus preventing operation of the sear.

(b) When the sear is in the lowered position, the safety catch cannot be moved because the lug of the sear is in the recess of the safety catch.

(c) If the gun is assembled with the sear in the raised position and the safety catch is at "S", the gun cannot be cocked because the sear is locked in the up position.

69. Question the squad.

Conclusion

70. Question the squad on mechanism.

71. Sum up.

LESSON 4—LOADING

Aim

72. To teach how to fill belts, to load, unload, set the sights and make safe.

Stores

73. Guns, drill rounds, links, wallets and targets.

Preliminaries

74. Safety precautions.

Approach

75. Explain the aim of the lesson.

Belt filling

76. Explain and demonstrate:—

(a) It will be necessary before and during instruction to link up drill belts for practice. These should be not less than 25 rounds for loading practice. In subsequent handling lessons belts of about 80 rounds will be carried slung over the left shoulder with the ends linked together.

(b) To fill the belt, position the projection of the first link into the centre gap of the second link. Insert the nose of the bullet into the seating thus provided and push on the base of the round until the projecting detent clicks into position in the groove at the base of the round.

(c) If it is necessary to remove a round from the link, push the nose of the bullet and withdraw from the link.

77. Practise the squad. Leave belts filled.

Loading and unloading—No. 1 only

78. Explain and demonstrate:—

(a) Loading position

No. 1 will lie straight behind the gun, legs together. Hold the small of the butt with the left hand, with an overhand grip. Hold the pistol grip with the right hand, forefinger outside the trigger guard. Check that the safety catch is at "F". Hold the gun upright.

(b) Loading

On the command, "Load"—

No. 1 will open the cover and position the belt on the feed tray with the first round up against the cartridge stop. Hold it in that position with the left hand and close the cover. Return the hands to the correct position on butt and pistol grip.

(c) Unloading

On the command, "Unload":—

No. 1 will raise the butt into the shoulder and cock the gun. Lower the butt, raise the cover and remove the belt. Ensure the feed tray is clear of empty links and examine the chamber. Whether a round is present or not, close the cover, raise the butt into the shoulder, ensure that the safety catch is at fire, roughly align the sights on the target and press the trigger. Lower the butt and close the ejection opening cover. Stand up and report, "Gun clear".

79. Practise the squad.

Clear gun

80. If the order, "Unload", "Clear gun", is given, the No. 1 will, after unloading, raise the cover to its upright position before standing to report, "Gun clear".

Loading and unloading—Nos. 1 and 2

81. Explain and demonstrate:—

The No. 2 will assist the No. 1 whenever possible.

He will lie down on the left of the gun close to the No. 1. During the actions of loading, when the No. 1 raises the cover, No. 2 will position the belt on the feed tray, ensuring that his fingers are clear before the cover is closed. During the actions of unloading he will remove the belt from the feed tray.

82. Practise the squad in pairs.

Sightsetting

83. Explain and demonstrate:—

- (a) The backsight, when folded down, is used in the LMG role. It is marked in one hundreds of metres up to 800 metres. The odd numbers are marked on the right side, even numbers on the left. To adjust the sights press in the catch and move the slide along the leaf, the top of the slide being set at the range ordered. The sight should be set to 200 metres when not in use.
- (b) The foresight is similar to the SL Rifle.
- (c) Aiming is as for the rifle.

84. Practise the squad in sightsetting.

Action on range being ordered

85. Explain and demonstrate with gun loaded:—

When the range is ordered:—

Set the sights, lift the butt into the shoulder and cock the gun, the right hand on the pistol grip with the forefinger on the trigger, left hand holding the small of the butt with an overhand grip.

Making safe

86. Load the gun, explain and demonstrate:—

If the order is given, "Prepare to move", or if the No. 1 decides it is necessary to move from one position to another, the gun must first be made safe:—

- (a) Unload as taught.
- (b) Load a new belt and fold it over the gun so that it balances easily. Raise the carrying handle. Check that spare belts are secured on the body.
- (c) On arrival at the new position remove the belt from the top of the gun and position it ready for firing.

During firing

87. (a) If a No. 2 is present he will assist the No. 1 as necessary. When he sees that the belt being fired is almost expended he will call out, "Belt, No. 1". The No. 1 will stop firing and the No. 2 will attach a new belt. On completion he will call out, "Ready".
- (b) It must be emphasised at all times that there is no necessity to hold the belt during firing, but No. 2 may be required to straighten the belt to assist correct feed.

88. Practise the squad.

Conclusion

89. Questions from and to the squad.

90. Sum up.

LESSON 5—FIRING**Aim**

91. To teach how to hold, aim and fire.

Stores

92. Guns, drill rounds, links, wallets, targets, eye discs.

Preliminaries

93. Safety precautions.

Holding and firing

94. Explain and demonstrate with gun loaded:—

When the range is ordered:—

- (a) Set the sights, lift the butt into the shoulder and cock the gun, the right hand on the pistol grip with the forefinger on the trigger, left hand holding the small of the butt with an overhand grip.
- (b) Move the whole of the body up to the gun until the right shoulder is firmly in contact with the butt.
- (c) Pull the butt backwards and downwards with the left hand, with the left elbow as far forward as possible.
- (d) Hold the pistol grip with the right hand, forefinger on the trigger, and pull the gun backwards and upwards into the shoulder.
- (e) The hold should be locked by turning the wrists inwards. The cheek should be rested firmly on the butt.
- (f) The hold should not be relaxed during the firing of the bursts.

95. When a target is indicated:—

- (a) Move as necessary until the gun, body and target are in line. The bipod should be square to the target at all times. The No. 2, if present, can assist the No. 1 by altering the position of the legs.
- (b) If it is found that the target is slightly above or below the horizontal, the elbows can be moved inwards or outwards until the position is correct.
- (c) If a large amount of movement is required, rotate the nut between the bipod legs to adjust for height.

96. Practise the squad.

97. On the command, "Fire":—

- (a) When the aim is correct press the trigger long enough to release a burst of not less than four to five rounds, then let the trigger go fully forward.
- (b) Observation of the burst is most important. The moment the trigger is released the left eye should be opened and the area of the target observed to ascertain the strike of the shots.
- (c) Make any necessary alterations to sights or aim and continue firing at the normal rate of about 25 rounds per minute.
- (d) On the command, "Stop", lower the butt to the ground and put the safety catch to safe. If the belt has only a few rounds left, connect another belt.
- (e) On the order, "Go on", continue firing at the normal rate.
- (f) On the order, "Make safe", act as taught.
- (g) It is the task of No. 2 to see that there is a full or partly filled belt on the gun, and No. 1 to make any necessary allowance for wind when firing.

Notes

98. Instructors must be conversant with details of checking faults in holding. Assistance in this subject can be obtained by a careful study of the contents of Section 3 of this pamphlet. The real test of a man's hold is to make him fire with live ammunition. Much can be done during instructional periods to teach him how to:—

- (a) Hold the gun correctly.
- (b) Operate the trigger without tightening or relaxing his grip.
- (c) Exert an even pressure with both hands, so that the group is not scattered.

99. To test the firmness of the hold pull the gun forward. To test the aim, hold the trigger operation use an eye disc, but ensure that the gun IS UN-LOADED.

100. Practise the squad in sight setting and holding.

Length of bursts and rate of fire

101. (a) Although the normal service burst is four to five rounds, the best length of the burst will depend on the type of target, the range and the skill of the firer.
- (b) With a burst of four to five rounds it is easier to observe the strike of the shots and correct errors in range and wind allowance.
- (c) A burst of eight to ten rounds spreads more but gives a better chance of hitting a moving target and may be necessary at very short ranges against a mass attack.

- (d) Rapid fire, which is the best rate at which the firer can maintain his accuracy, will only be used when the target warrants it, i.e., a large number of enemy in the open at a short range, or it may be used for short periods when "shooting in" an attack by our own troops.
- (e) Normal rates of fire will not overheat the barrel, but rapid rates and long bursts for any length of time will. The firer must use his common sense and regulate his rate of fire and length of bursts to the tactical situation, remembering that overheating quickly wears out the barrel and affects its accuracy.
- (f) Should the Section Commander require rapid fire he will order, "Rapid". The firer will bring the gun into the shoulder, prepare to fire and when the order, "Fire", is given he will fire at a rate of about 100 rounds per minute.
- (g) If time permits the gun should be unloaded, the action cocked and the cover raised so that the gun may be cooled.

Moving targets

102. Select a point of aim well in front of the line of advance of the moving target. Aim at it and when the target is one width from that point of aim fire a long burst of eight to ten rounds. The most likely targets are soft-skinned vehicles and unbattened AFVs.

103. Practise the squad.

Conclusion

104. Questions from and to the squad.

105. Sum up. Stress the importance of holding and aiming correctly.

LESSON 6—IA AND STOPPAGE DRILL

Aim

106. To teach the soldier the drills to be applied if the gun will not fire, or stops firing, or fires one or more rounds and stops again.

Stores

107. Gun, drill rounds, links, wallets, targets.

Preliminaries

108. Inspect gun, drill rounds and revise on loading and unloading.

Approach

109. If the gun is correctly cleaned and prepared for firing, stoppages, other than the expended belt, will seldom occur. If a stoppage does occur you must know what to do to remedy it quickly, so that firing can be continued without undue loss of time.

Immediate action drill

110. Explain and demonstrate:—

If the gun stops:—

- (a) Lower the butt.
- (b) Cock the gun. If you cannot cock the gun fully, hold the cocking handle as far back as possible.
- (c) Open the cover; remove the belt and close the cover **AS QUICKLY AS POSSIBLE**.
- (d) If you have not fully cocked the gun, pull the cocking handle fully to the rear.
- (e) Raise the butt into the shoulder and press the trigger. A round may be fired.
- (f) Load a new belt; cock the gun and carry on firing.
- (g) The following stoppages will be remedied by applying the immediate action.

(i) Expended belt:—

Demonstrate how the last link may have to be cleared from the feed tray.

(ii) Damaged rounds.

(iii) Live round partially fed, due to a damaged link.

(iv) Misfired round.

(v) Hard extraction.

Practise squad

111. Order, "Gun firing all right—gun stops". When the actions have been completed, order, "Gun firing all right".

Stoppage drill

112. If, after applying immediate action, the gun fires one or more rounds and again stops, the No. 1 will:—

- (a) Lower the butt.
- (b) Cock the gun.
- (c) Put the safety catch to safe.
- (d) Adjust for more gas by two clicks. If the regulator is hot, use the nose of a round.
- (e) Put the safety catch to fire and continue firing.

If the stoppage recurs repeat the above drill until the gun functions satisfactorily.

113. If the stoppage cannot be remedied by this drill, change the recoil mechanism.

114. Practise the squad.

115. Order as follows:—

When the immediate action has been completed, order, "Fires one or more rounds and stops again". When the gas adjustment has been made, order, "Gun firing all right".

Further stoppages

116. If, after you have applied immediate action, the gun will not fire:—

- (a) Clear the gun as in immediate action.
- (b) Cock the gun, open the cover, raise the feed tray and inspect the interior for:—

(i) Obstruction.

(ii) Empty case in chamber.

If there is an obstruction, remove, reload and continue firing.

If an empty case is seen in the chamber, this is due to a broken extractor or spring. Allow working parts to go forward, remove recoil mechanism and change the part, reassemble, extract the empty case, operating the mechanism by hand, load and carry on firing.

- (c) If no obstruction is found, allow the working parts to go forward, remove and inspect recoil mechanism for:—

(i) Weak or broken return spring.

(ii) Broken firing pin.

(iii) Broken ejector or weak ejector spring.

Replace the defective part or change the recoil mechanism, reassemble, load and continue firing.

- (d) If no defective parts are found the stoppage is probably due to a separated case. Reassemble the gun and, using the clearing plug, remove the separated case. Load and carry on firing.

Practise the squad

117. (a) When immediate action is complete, order:—

"Gun won't fire".

- (b) When the man inspects the interior, order either:—

"Obstruction".

"Empty case in chamber".

"No obstruction visible"—Here the man will inspect the recoil mechanism, then the instructor orders either:—

"Broken return spring".

"Broken extractor".

"Broken firing pin".

"Broken ejector or weak ejector spring".

"No broken parts"—Here the man will carry out the drill to remove a separated case.

(c) When the correct drill has been applied, order:—

"Gun firing all right".

118. Explain:—

If after applying the immediate action (IA), the gun will not fire and you cannot fully cock the gun, proceed as follows:—

(a) Hold the cocking handle as far back as possible.

(b) Open the cover, remove the belt and close the cover quickly.

(c) Cock the gun fully; press the trigger.

(d) Open the cover and examine the feed pawls and springs.

(e) If the feed pawls are not working freely, clean and oil.

Practise the squad

119. Order, "Gun firing all right—gun stops". When the actions have been completed and the trigger pressed, order, "Gun won't fire", and when the No. 1 reaches forward to cock the action, order, "and will not cock".

Runaway gun

120. Explain and demonstrate:—

If, on starting to fire, or during firing, the gun continues to fire after the trigger has been released:—

(a) Hold the gun firmly in the shoulder.

(b) Twist the belt at the point of entry into the feedway.

(c) When the gun stops, adjust for more gas.

121. Practise the squad in all stoppage drills.

Conclusion

122. Questions from and to the squad.

123. Sum up.

LESSON 7—INTRODUCTORY SHOOT

Aim

124. To introduce and practise the soldier in firing the gun.

Stores

125. Guns, wallets, cleaning materials, SAA and normal range stores.

126. Targets. If the introductory shoot is fired at 25 metres, a white screen should be used. Each firer should have four aiming marks, spaced in the form of a square and about one foot apart. If fired at 100 metres, the rifle grouping target should be used.

Preliminaries

127. Safety precautions.

Notes

128. (a) Guns must have been zeroed and the gas regulator adjusted correctly before this lesson is taught.

(b) This lesson should be taught on either the 25 or 100 metres range.

(c) Coaching is most important at this stage of training.

(d) Range work should not be hurried and the shoots should be repeated as time and ammunition permit.

(e) Tracer ammunition will not be used on the 25-metre range.

Approach

129. Explain that to ensure correct functioning, the gun must be clean and the gas regulator adjusted correctly.

Cleaning before firing

130. Order the guns to be prepared for firing as taught in Lesson 2.

Introductory shoot—25 metres

131. Give conditions of Test No. 7.

132. (a) Each man should fire 10 rounds in bursts of four to five rounds into the stop butts to get the feel of the gun.

(b) Fire one burst of four to five rounds at each of four one-inch black aiming marks.

(c) Discuss the results on the target.

(d) Repeat if time and ammunition permit.

(e) At the conclusion of firing and all subsequent firing periods inspect all guns and pouches to make sure that no live SAA is present and account for all rounds brought on the range.

Care during firing

133. Every opportunity should be taken to clean, examine and oil the gun during lulls in firing. Special attention should be given to the chamber and gas affected parts.

Cleaning after firing

134. On completion of firing the guns must be thoroughly cleaned, as taught in Lesson 2.

LESSON 8—HANDLING, LMG ROLE**Aim**

135. To teach handling in the LMG role.

Stores

136. Guns with slings attached, at least two 80-round drill belts per gun, wallets.

Instructor's notes

137. Under battle conditions No. 1 will carry three belts of about 80 rounds slung over the left shoulder. No. 2 will carry three belts slung as above.

Dress

138. Battle Order; rifles for all No. 2s.

Preliminaries

139. Carry out safety precautions.

The No. 1 will inspect the gun and contents of the wallet.

Carriage of ammunition

140. Explain and demonstrate:—

- (a) Ammunition will be supplied in belt boxes each containing one 200-round belt. When preparing belts for carriage the belt should be broken into lengths of about 80 rounds.
- (b) The belt will then be slung over the left shoulder and fitted to the individual. The belts should fit snugly, being neither too tight nor too loose, the base of the round uppermost.
- (c) Gun numbers should carry three belts each. If more ammunition is required for the gun, each rifleman will carry one belt slung as above.
- (d) Short strips of belt will be linked together and any remaining over and above the section load should be repacked in belt boxes.

Loading

141. Demonstrate:—

- (a) No. 1 will roll his body to the left and break the belt at a point in front of the chest. He will then flick the belt behind the body with the right hand, at the same time pulling the belt with the left

hand. Then load as taught. The No. 2 may be required to give some assistance to prevent the belt being caught up in the equipment of No. 1.

- (b) No. 2 will, when his belts are required, carry out the actions detailed above.

142. Practise the squad. Leave the guns loaded.

Approach

143. Having been taught and practised in the drills of Loading, Holding and Firing, you are now going to be exercised in the handling of the gun, firstly as a team with the No. 1, assisted by the No. 2, and secondly, the No. 1 acting alone.

Fire positions

144. Explain and demonstrate:—

Firing the gun from cover is much the same as firing a rifle. Special points to note about it are:—

- (a) In order to change belts quickly the No. 2 should always be on the left of the gun, concealed as much as possible. His position should also permit him to observe and direct fire as ordered by No. 1 and keep in touch with the section commander and the rest of the section.
- (b) It will sometimes be necessary to fold the bipod legs in order to make the best use of cover. The gun should then be rested as near as possible to where the legs are joined to the gun.
- (c) Always ensure that the ejection opening cover is clear, to allow the empty cases to be ejected.
- (d) If the ground is sloping, the sights can be kept upright by rotating the gun in the bipod sleeve.
- (e) The method of crawling will be as laid down in Infantry Training Vol. I, Pamphlet No. 2, Fieldcraft (All Arms) 1954, Lesson 8, except that the left side of the gun will always be uppermost.

145. Practice should now be given in mounting the gun of various types of cover. No. 2 should be exercised in his duties. Change over Nos. 1 and 2 during practice.

Duties

146. (a) No. 1 will carry and fire the gun according to the fire direction and control orders given by the Section Commander.

(b) No. 2 will assist the No. 1 in every way possible and is responsible for:—

- (i) Servicing the gun, i.e., assisting to load, etc.
- (ii) Observing fire as ordered by No. 1.
- (iii) The collection of belts from the riflemen as required.

Battle handling—basic drill

147. (a) Action of No. 2

On the command, "Take cover", No. 2 will get down behind the nearest cover and move cautiously into a position from which he can observe the front without being seen. He will select a likely gun position and point it out to No. 1. When the gun is in position, lie down on the left side of No. 1, ready to assist in loading, observing and directing the fire.

(b) Action of No. 1

- (i) On the command, "Take cover", No. 1 will get down behind the nearest cover, watch No. 2 and when his fire position is indicated, crawl to it and get into a position of observation, keeping the gun behind cover.
- (ii) When the Section Commander orders a range, No. 1 will set the sights, mount the gun and cock it. He will fire as ordered.
- (iii) If, after receiving the order, "Take cover", no further orders follow, the No. 1 should try and spot the enemy until the Commander takes control. He should remember the drill:—"Take cover—crawl—observe—sights—fire."
- (iv) On the command, "Stop", act as taught. Keep the butt in the shoulder.
- (v) On the command, "Go on", start firing again.
- (vi) "Prepare to Advance"—Make safe, get the gun behind cover, move to one side and await the order, "Advance".
- (vii) If a long bound has to be made the gun will be "made safe", but for a short advance, i.e., to an alternative position, the safety catch will be put to "Safe".
- (viii) "Advance"—Ensure that you do not break cover from the same position as you were firing.

148. The men should not be practised in the basic drill on various types of ground and cover in pairs.

Conclusion

149. Questions from and to the squad.

150. Sum up.

LESSON 9—SECTION HANDLING, LMG ROLE

Aim

151. To teach the soldier:—

- (a) How a section is organized and equipped.
- (b) The duties in a section in action.

Dress and stores

152. Battle order, camouflage materials, blank ammunition if available, blank firing attachments. Guns with slings, wallets, drill belts.

Notes

153. If it is not possible to equip a demonstration section, lay a section's arms, ammunition, magazines and carriers on the ground.

- (a) Section handling is the link between individual weapon training and tactics, in which soldiers learn to work in groups and section teams.
- (b) The section is divided into a rifle group and an LMG group. The LMG group consists of two men.
- (c) The basic weapons of the Infantry are the rifle and LMG. Either can give effective fire support, but both groups of a section will usually be used together. Since a complete section is normally the smallest sub-unit which gives covering fire to other troops. However, in certain cases, it may be necessary to carry out fire and movement within the section. When this happens the section works in its two normal groups.
- (d) The basic loads for the section are as given below, but many factors make changes necessary—the section's task, its strength, the climate, the ground and the opposition expected.

Preliminaries

154. Safety precautions.

Approach

155. The knowledge learned as an individual must now be applied to handling within the section.

Section organization

156.

Duty in section	Weapon	SAA	Other equipment
Section commander	Rifle and bayonet	3 mags of 20 rounds; 1 belt of about 80 rounds, slung	Machete, wire cutters, whistle, watch, map case, entrenching tool; 2 AP HE grenades; 2 smoke grenades.
Nos. 1-5 riflemen	Rifles and bayonets	3 mags of 20 rounds; 1 belt of about 80 rounds, slung	Entrenching tool; two men carry AT grenade launcher and two HEAT grenades, if ordered; 1 AP HE grenade; 1 smoke grenade.
No. 1 LM gunner	LMG	3 belts of about 80 rounds, slung	SP wallet, entrenching tool.
No. 2 LM gunner	Rifle and bayonet	3 mags of 20 rounds; 3 belts of about 80 rounds, slung	Entrenching tool; 2 smoke grenades.
Totals:— 1 section commander, 7 other ranks	7 rifles, 1 LMG	21 rifle mags = 420 rounds in mags; 12 belts of about 80 rounds. Total in section:—rifle, 420 rounds; LMG, about 960 rounds.	1 machete, 1 pair of wire cutters, 1 whistle, 1 watch, 7 AP HE grenades, 9 smoke grenades, 8 entrenching tools, 2 AT grenade launchers, 4 HEAT grenades, 1 SP wallet, 1 map case.

The rest of the section's equipment is carried in company transport.

Control

157. The section commander will control the gun himself. Occasionally the No. 2 may be used as a link and the gun controlled through him. The platoon commander may group up to two LMGs of the platoon and control them himself.

Fire and movement

158. Infantry can seldom get within assaulting distance of the enemy without coming under small arms fire. When that happens they must be given suitable covering fire while they move. Such support will normally be given by another sub-unit and/or by artillery, mortars, sustained fire guns, tanks or aircraft. This is fire and movement, the basis of all Infantry tactics. The main rules are:—

- Before the movement element begins, the covering element must be in a firing position, ready to open fire at once, or be actually firing, and fire must be continued as long as is needed to keep the enemy heads down until the last possible moment.
- Both elements must make the best use of ground and cover.
- The covering element must act at once on the order to fire.
- The moving element—if the intention is to move under cover of fire—must not begin to move until the covering fire has started.

Ammunition supply to the gun

- (a) Where, according to the task and conditions, extra ammunition is required, a rifleman may be added to the gun team. He will carry two belts in addition to the one normally carried, and will always position himself near the gun group.
- (b) In defence, extra ammunition and stores will be dumped and will be distributed and protected according to the section commander's orders.

Method of conducting section handling exercises

Notes

160. Repeat this lesson several times on different ground each time. Treat it as a basic lesson the first time, make it simple and have the section in extended line. As more practice is given, other formations should be used; targets should be selected that are difficult to recognise. If possible have "live enemy" firing blank ammunition. Introduce gun stoppages and casualties in the gun group. The instructor must act as section commander and give all orders. He should always be in such a position that he can see what each man is doing. Emphasise the importance of:—

- Firing immediately the order is received.
- If the plan is to move under cover of fire, not to move until the covering fire has actually started.

Preparation

161. Choose and reconnoitre the ground carefully; remember that you want to practise fieldcraft, the choosing of fire positions, the use of cover and the ammunition supply within the section.

Criticism

162. If instructors are going to watch all they should and check faults effectively, they must be extremely active and get round the section really fast after they have given orders. These are the main points to watch:—

- (a) Elementary handling: buttoning of pouches; loading and re-loading; use of the safety catch; action on "Stop" and "Go on"; care of arms and ammunition; counting of rounds fired; sight setting; making safe, and ammunition supply.
- (b) Fieldcraft: use of cover; crawling; approaching and occupying positions; taking up a fire position without moving away after going to ground; moving into a fire position without first setting sights and spotting the target; choice of fire positions; mounting the LMG; recognition (and later, indication) of targets; frequent changing of position to puzzle the enemy, and "Take cover, crawl, observe, sights, fire" drill.

Preliminaries

163. Safety precautions: make the men prepare for battle and equip themselves as taught; inspect them; question them briefly on how a section is organized and equipped for battle.

Approach

164. It is no good knowing how to handle your weapons unless you can still do it without thinking in the confusion of battle. This lesson teaches you what each man has to do when the section is on the move.

Exercising the section as a team

- 165. (a) Act as section commander, get the section in extended line, show them the axis of advance, and the "enemy", order, "Advance", and then after a pause order, "Take cover" and give a fire control order. Continue by ordering "Stop" and "Go on" and giving fresh fire control orders for long enough to let No. 2 start his ammunition supply drill.
- (b) Jump up and check each man (see para 162); get the riflemen round the gun and discuss the fire positions, actions, handling and fieldcraft of Nos. 1 and 2.
- (c) Give as many men as possible a chance to act as No. 1 or No. 2.

Conclusion

- 166. Questions from and to the squad.
- 167. Sum up.

LESSON 10—CLOSE QUARTER BATTLE

Aim

168. To teach and practise the soldier to fire the gun at close quarters.

Stores

169. Guns, slings, drill belts, wallets, figure targets.

Notes

170. When this lesson has been taught, live practices should be fired.

Repeat the firing as often as ammunition permits.

Preliminaries

171. Safety precautions.

Approach

172. In the assault, in street fighting, in wood and close country, the GPMG can be used as a close quarter weapon. The firer must remember that before the belt is fully expended he should get to cover and load a fresh belt. If No. 2 is present, it is his duty to see that the gun does not run out of ammunition.

Position and firing

173. Explain and demonstrate:—

- (a) Loosen the sling, load, cock the gun and put the safety catch to safe, lift up the gun and loop the sling over either shoulder, fold and lock the bipod legs underneath the gun. Loop the belt over the left arm. When moving keep the gun cocked and rely on the safety catch for safety, e.g., when crossing obstacles put the catch to safe, returning it to fire when clear.
- (b) During the advance, hold the gun with the right hand on the pistol grip, forefinger clear of the trigger. The left hand should hold the folded bipod legs in such a manner that the fingers are clear of the barrel.
- (c) When a target appears, advance the left leg in the direction of the target, body leaning forward in the "on guard" position, press the gun into the right side and hold firmly.
Fire in bursts of four to five rounds by sense of direction and correct by observation.
- (d) Although it is possible with training to fire whilst advancing, far better results are obtained by pausing momentarily to fire each burst.
Firing from the waist requires good holding and a grim determination to hit the target rapidly and accurately.

- (e) When deciding over which shoulder to put the sling, the firer must remember that if the sling is over the left shoulder, it takes longer to bring the gun into its bipod role. He must be guided in the matter by closeness of the country, the size of the wood, etc., through which he will be expected to use the gun in its close quarter battle role.

Practice

174. Each man should be practised in the firing position and moving to cover to reload. Practice must also be given in stoppage drill. Subsequent practice, which should take place immediately afterwards, will be by live firing at targets at short ranges up to 25 metres.

Conclusion

175. Questions from and to the squad.

176. Sum up.

LESSON 11—AA HANDLING, LMG ROLE

Aim

177. To teach how to handle the gun quickly as an AA weapon.

Stores

178. Guns, slings, drill belts, wallets.

Notes

179. Instructors must be fully conversant with Infantry Training Vol. I, Pamphlet No. 6, The Light Machine Gun and Section Handling, Chapter 2, Section 10, The Principles of Small Arms AA Fire.

Preliminaries

180. Safety precautions.

Approach

181. (a) Orders will always be given as to when to open fire and at what target.
(b) The gun needs no special preparation for AA firing, except to adjust the gas regulator to give maximum gas.

Firing position

182. Explain and demonstrate:—

(a) Kneeling

Loosen the sling, place it over the right shoulder, hold the gun with the bipod legs folded, kneel on the right knee, keep it well out to the right and rest the butt on the thigh.

(b) Standing

Proceed as for kneeling, but hold the gun underneath the right arm or against the hip. Keep the left foot well forward and lean forward with most of the body weight on the left foot. The head will be kept well back.

Firing

183. (a) On taking up position, load, cock the gun and put the safety catch to safe. On the alert, or stand to, pick up the gun, fold the bipod legs and hold it as taught and put the safety catch to "Fire". Loop the belt over the left arm.

(b) To fire, concentrate on the target. If the aircraft is coming straight at you, point the gun at its nose. If it is slow and crossing, point the gun well in front of it in its line of direction, so that it flies into the bullets. You must swing with the aircraft.

(c) Fire a whole belt in a burst, watch the tracer stream and correct accordingly.

(d) If the stream passes behind a crossing aircraft, make a bold swing forward.

(e) Turn right about, when possible.

(f) When the belt has been fired, cock the gun, put the safety catch to safe, lay the gun on the left knee and open the cover.

(g) No. 2, who will be on the left of the No. 1, will load as taught.

(h) No. 1 will complete the actions of loading, put the safety catch to "F" and prepare to engage the target.

The men should be practised in firing and changing belts in pairs.

Words of command should be:—

"Aircraft front" (left or right)

"Stop", or

"Make Safe".

Practice

184. Each man will be practised in firing from trenches and from stationary and moving vehicles.

Explain:—

(a) In a trench lean against the back of it for support.

(b) Different positions suit different vehicles. The No. 2 must support the No. 1, if necessary.

Conclusion

185. Questions from and to the squad.

186. Sum up.

CHAPTER 2—EXTRA INFORMATION FOR INSTRUCTORS

SECTION 1—ZEROING, LMG

187. The gun will be zeroed on the tripod in both roles. Any adjustments that may be necessary will be carried out by REME, or a qualified NCO.

188. The LMG is a team weapon, not a personal one. The No. 1 of the team will aim and fire the gun during zeroing, and when completed all other members of the section will then shoot it and make a careful note of any alteration they require to the sights or point of aim.

189. Errors in elevation are corrected by turning the foresight up or down. If it is turned up, the MPI of the group will be moved down, and vice versa. One half turn of the foresight, i.e., 180 degrees, will move the MPI vertically about one inch at 25 metres and about four inches at 100 metres. There are two sizes of foresight—small and large. There are five complete turns of each foresight. To turn the foresight lift up the hinged securing clip from the rear of the foresight block and, using the adjusting tool, screw the foresight either up or down sufficient to correct the zero. Push the securing clip firmly down to lock the foresight.

190. Errors in direction are corrected by moving the foresight laterally. If it is moved to the left the MPI of the group will be moved to the right, and vice versa. To move the foresight to the left insert the Allen key of the adjusting tool into the Allen screw and loosen the screw the required amount, then tighten the screw on the right, thus moving the foresight along its dovetail to the left. One half turn of the adjusting screws will move the MPI $\frac{3}{4}$ inch at 25 metres and three inches at 100 metres.

191. When corrections have been made, always check that the screws are tight and that the securing clip is firmly down.

Method of testing

192. Prepare the gun for firing in the normal way. Mount the gun and tripod, ensuring that the shoes are stamped firmly in the ground. Check that:—

- The gas regulator is adjusted correctly.
- The foresight is in good condition and that the hinge clip and Allen screws are tight.
- Fire two to three rounds in a burst to dry the barrel.
- Fire one five-round group and by measurement find the MPI and alter the sights accordingly.
- Zero the gun until the MPI is $\frac{3}{4}$ inch above the point of aim at 25 metres or 3 inches at 100 metres. The permissible error is $\frac{1}{2}$ inch at 25 metres and two inches at 100 metres.
- The No. 1 will fire a check group to confirm the zero.

193. Remove the gun from the tripod. The No. 1, and each member of the section, will now fire a five-round group. From this each man will calculate the variation of the MPI of his group in relation to the zero group, to enable him to make any alteration to the backsight or point of aim at the longer ranges.

SECTION 2—ADDITIONAL STRIPPING AND ASSEMBLY

194. The stripping of the trigger group and feed mechanism may be carried out only by qualified NCOs.

The trigger group

195. Remove the joint pin from the rear of the trigger group by pushing the retaining pin from one side and the centre pin from the other. Remove the trigger group, pivoting the grip slightly downwards. Take out the screws holding the side plates and ease off the plates. Set the safety catch to the "F" position. Pivot the safety catch clockwise until the lug on it is in line with the notch cut in the left side of the trigger guard. In this position the flat surfaces are downwards. Remove the safety catch. Holding down the sear, push out the sear pin and lift the sear. Push out the sear spring pin and remove the sear spring. Push out the trigger pin and remove the sear and trigger. Unhook the sear hook from the trigger.

Assembly

195A. Put the sear hook into the trigger with the nose of the sear uppermost. Insert into the frame and line up the trigger hole—insert the trigger pin. Lift the sear. Put back the sear and trigger spring with the coil to the rear and secure with the pin. Pull the sear down; insert the pin. Replace the safety catch from the left, ensuring that the end marked "S" goes in first, turn anti-clockwise until the flats are to the rear. Press the trigger and release it, then push back the sear trip to release the sear. Replace the sideplates. Whenever the trigger group is removed, always ensure that the safety catch is at "F" before assembling back in the gun.

The feed mechanism

196. Open the cover, remove the clip pin from the nut and unscrew the nut. Push out the axis pin and lift off the cover and feed tray. Depress the feed pawl and push the cartridge guide towards the rear of the cover and raise it to ease the spring tension. Push out the pin of the cartridge guide and remove with its two springs. Remove the feed arm control spring, disengage the retaining spring and lift out the feed arm. Remove the circlip from the feed pawl assembly and lift out the assembly; do not strip the assembly. Remove the cover catch spring with catches left and right.

Assemble in reverse order.

SECTION 3—COACHING

Zeroing

197. The method of zeroing has been covered in Section 1. Instructors must realise that although the No. 1 (the best shot) will zero the weapon, each

man in the section must sight at 100 metres. From the position of his group, in relation to the point of aim, he can learn what errors in either direction, or elevation, or a combination of both, he can expect at longer ranges.

Sighting

198. The normal service bursts must be insisted upon at all sighting shoots. The standard to be aimed at is an eight-inch group or less at 100 metres. Errors in holding must be carefully criticised during this stage of the soldier's training and every opportunity must be taken to correct errors in holding.

Considerations on holding

199. The problems of holding the LMG are quite different from that of the rifle. The rifleman must hold his rifle perfectly steady while perfecting his aim and then operates the trigger. This requires a firm hold. With the LMG the firer has the bipod to assist him to hold the gun steady, and because of this factor, plus the extra weight of the gun, the firer tends to hold less firmly. This is quite wrong. The instructor must insist, at all times, that the gun is held firmly. The automatic action of the gun sets up vibrations which must be controlled—not merely at the start of the burst, but during the whole of the burst and after the trigger has been released. The criterion as to whether this is accomplished successfully is whether the "sight picture" is the same at the end of the burst as at the beginning. The sights will dance about during the burst, but if they bear the same relationship on the target at the end as at the start, then the holding was good. If the sights are pointing at the top of the target at the end of the burst, the gun has taken over control and the group will be seen to have "run-up" the target. Examination of the target will indicate to a good coach the errors in holding.

What to look for at the firing point

200. Some errors can be detected on the firing point. These are:—

- (a) Pulling the gun into the shoulder instead of moving the body up to the gun.
- (b) Body oblique to the gun.
- (c) Closing the right eye as the trigger is operated.

The above points should be easy to detect and (a) and (b) can be corrected and put right before the man fires.

200A. The points less easily detected are:—

- (a) Relaxing the grip during the firing of the bursts, or
- (b) Tightening the hold.

Limbering up

201. This is most important; the firer should be allowed to aim at the target, and, concentrating on the foresight, rock the gun straight backwards and forwards, imitating firing. If the foresight does not move up and down, the position of the body is at fault and must be moved slightly either way to

correct. The sight picture seen during the "limbering up" stage will give a good indication of what is likely to happen once firing begins. Having carried out this drill, the firer should be instructed to keep the elbows in the same position throughout his shoot.

Declaration of the point of aim

202. It is doubtful whether this is of the same value to the coach as it was with the rifle. By the time the firer has reached this stage of training on the LMG, he will have fired his rifle course. He should therefore be able to hold a correct aim for a single shot. It would be quite wrong to insist on a declaration of the first shot in each burst, since this would prevent him from restraining his breathing during the firing of the burst. If he declares his point of aim at the end of the burst, and poor holding has resulted in the shots running to the right or left and off the target, there is a danger that the coach will order the firer to adjust his point of aim to counteract the error, with the result that the first two or three rounds of the next burst may be off the target. The aim of the coach must be to correct loose holding, by either altering the firer's position or adjusting the hold.

Coaching at 25 metres

203. The 25 metres range is perhaps the ideal range on which to coach the gunner during early stages of training. The order of arrival of each shot of the burst can be clearly seen; furthermore, the screen can be brought back to the firing point and criticism can be done whilst the second detail fires. In the introductory shoot, four bursts should be fired at four different aiming marks. The coach first examines the firer's position and when satisfied that all is well, he should then watch the target. Each burst should be regarded as a separate shoot, and any errors spotted at the target should be corrected between bursts. General faults are:—

- (a) Group running to left—the right shoulder has not been brought up to the gun, and the butt tends to move rearwards and to the right.
- (b) This is also the case where the body is oblique to the gun, the right shoulder sloping away from the butt.
- (c) When the first shot is near the point of aim and subsequent shots form a group at some other point, it is fair to assume that the grip has been tightened during the burst.
- (d) A scattered group around the point of aim indicates loose holding.

204. The firer must achieve a three-inch group average before progressing to the 100 metres range.

Coaching at 100 metres

205. This is the second stage of grouping. The firer MUST achieve an eight-inch grouping standard before progressing to longer ranges. The coach must use binoculars and, as at 25 metres, must watch the order of arrival of the shots on the target. Any errors in holding will be corrected immediately

after each burst. The target will be a four-foot target, quartered, with an aiming mark in each quarter. One burst of about five rounds should be fired at each aiming mark. The firer will then be taken to the target and errors in holding pointed out.

206. At longer ranges the coach must watch the area round the target. He should advise the firer on the necessary wind allowance and on any corrections for elevation.

Length of bursts

207. It would be wise during the introductory shoot to let the firer load with a five-round belt. In this way he quickly learns for how long to press the trigger. He must be taught to continue his hold after the last round of the burst has been fired, and to note the relationship between his foresight and the point of aim. The firer must be taught how to correct hold and position to correct his faults.

The coach

208. It is an advantage to be an expert gunner but not a necessity. The aim of the coach must be:—

- To correct faults intelligently.
- To produce results.
- To prepare the firer to fire his annual course.
- To impart sufficient knowledge to the firer so that he can fire accurately without assistance.
- And finally to encourage and promote within the firer the confidence and pride in his ability to master the weapon.

SECTION 4—TRAINING TESTS

209. Soldiers under training will be tested by means of these training tests to find out if they have reached the required standard before going on to more advanced training.

210. The various tests should be inserted in the appropriate place in the training programme.

211. Before testing, explain to the soldiers the test conditions. Let them ask questions. Once the test begins do not help them any more. Always tell them the results of the tests and where they went wrong.

212. Grade men as follows:—

Skilled	—	70 to 80 marks
Above average	—	60 to 69 marks
Average	—	50 to 59 marks
Below average	—	40 to 49 marks
Failed	—	Less than 40 marks

SECTION 4—TRAINING TESTS

Test No.	Subject	Stores	Conditions	Marking
1	Loading No. 1 tested for time and actions	Gun, drill belts, drill rounds, stop watch.	No. 1 will be standing behind the gun. Safety catch at "F". Belt on the ground on left of gun. On the command, "Load", get down and load. Time is taken from "Load" until the No. 1 has both hands in their proper position on the gun.	6 seconds — 10 8 seconds — 8 10 seconds — 6 12 seconds — 4 Over 12 seconds — NIL Take off one mark for each mistake. Take off five marks if the mistake affects safety. HPS — 10
2	Make safe.	As for Test No. 1.	No. 1 behind the gun; gun loaded. Give a range. Order, "Make Safe". Time taken from order, "Make Safe", until No. 1 has both hands in position on the gun.	8 seconds — 10 10 seconds — 8 12 seconds — 6 14 seconds — 4 Over 14 seconds — NIL Take off one mark for each mistake. Take off five marks if the mistake affects safety. HPS — 10

TRAINING TESTS

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Test No.	Subject	Stores	Conditions	Marking
3	Unload.	As for Test No. 1.	No. 1 behind the gun; gun loaded and ready to fire. Safety catch at "S". Give the command, "Unload". Time taken from "Unload" until No. 1 is standing up behind the gun and "Gun clear" is given.	6 seconds — 8 seconds — 10 seconds — 12 seconds — Over 12 seconds — Take off one mark for each mistake. Take off five marks if the mistake affects safety. HPS — 10
4	IA and Gas Stoppage Test of Nos. 1 and 2.	As for Test No. 1.	Nos. 1 and 2 behind the gun; gun loaded and firing. Order, "Gun Stops", When IA has been done, order, "Gun fires one or more rounds and stops again". Time taken from "again" until the No. 1 has aimed and fired again. A round may be used to adjust the gas regulator. Although IA is not in the time limit, it will count in the test as regards mistakes made.	6 seconds — 7 seconds — 8 seconds — 9 seconds — Over 9 seconds — Take off one mark for each mistake. Take off five marks if the mistake affects safety. HPS — 10

TRAINING TESTS

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Test No.	Subject	Stores	Conditions	Marking
5	Stripping and assembling.	As for Test No. 1 but no watch.	The man strips the gun, which should be loaded before the start of the test and puts it together again as taught in Lesson 1.	Give 10 marks; take off one for each mistake; if any mistake involves safety, give NIL marks. HPS — 10
6	Handling test of Nos. 1 and 2.	Gun, sling, wallet, drill, belts.	Start with gun loaded. Order, "Advance", and order Nos. 1 and 2 to occupy a position behind cover. Give a fire order, "Stop", "Make safe", "Prepare to move", "Move".	Give 20 marks. Take off two marks for any mistake which would lead to inaccurate fire or danger (in making safe, for instance) and one mark off for any other mistake. HPS — 20
7	Grouping.	Gun, wallet, SAA	The soldier fires two five-round groups in bursts at 100 metres (or 25 metres). Take the better group.	8 inch (2 inch) — 16 inch (4 inch) — 24 inch (6 inch) — 24 inch (6 inch) and 1 wide: 2 HPS — 10

HPS for all tests: 80

PART II—FIRE CONTROL

CHAPTER 3

GENERAL PRINCIPLES OF FIRE CONTROL

INTRODUCTORY NOTES

Introduction

213. The considerations which govern the methods of applying machine gun fire are:—

- (a) The best fire effect on the whole target.
- (b) Economy of time and ammunition.
- (c) Simplicity and speed.
- (d) Safety of our own troops.

The factor of surprise as applied to fire cannot be over estimated. Fire control orders must be framed in such a way that all these requirements are met. The system of fire control laid down is worked out on the above basis and should be adhered to. Occasionally the situation may not permit the rules given to be carried out in their entirety. Common sense and a knowledge of how the rules are arrived at will enable the best fire effect to be obtained.

Basis of fire control rules

214. Fire effect is desirable as soon as fire is opened, or immediately after. Observation of fire is made easier by the use of mixed belts of one tracer to four ball rounds. Tracer burns out at about 1,100 metres. Beyond this range observation of fire is only possible on certain types of ground. There is no quick and reliable means of determining with accuracy the effect of climatic conditions. Errors, both of direction and elevation, must therefore be expected. The procedure is to define round the target an area allowing for reasonable errors of direction and elevation and to apply fire over the whole of this area.

Direct fire

215. The normal method of engaging a target will be by direct fire, i.e., by laying on the target using the gun sights. The main asset of direct fire is its extreme flexibility, which enables a succession of targets over a wide arc to be engaged quickly. Conditions which affect the field of view, e.g., bad visibility, fog, smoke, etc., often arise after a position has been occupied. When this occurs the dial sight provides the means to continue the engagement of a target.

LESSON 12—CHARACTERISTICS OF MACHINE GUN FIRE

TO BE TAUGHT TO ALL PLATOON COMMANDERS AND NCOs

Aim

216. To teach the fire controller the special characteristics of machine gun fire and their effect on the employment of machine guns.

Stores

217. Blackboard, chalk and theory diagrams if available.

Approach

218. Give the aim of the lesson and explain the Introductory Notes to the chapter.

Terms used in the sustained fire role

219. Explain the terms, using diagrams on blackboard:—

(a) *Firing of the round*

When the cartridge is fired a rapid build up of gases forces the bullet up the barrel. During its passage up the barrel the bullet is given a rotary movement by the rifling of the barrel. The bullet leaves the barrel with a velocity of about 2,700 feet per second.

(b) *Trajectory* (show diagram)

When the bullet leaves the barrel the path it follows through the air is called the trajectory. Two forces act on the bullet, gravity and air resistance. Gravity causes the bullet to fall towards the ground and thus the trajectory is curved. Air resistance causes the bullet to slow down during flight and thus the curvature of the trajectory becomes greater as the trajectory becomes longer. The highest point on the trajectory is called the *culminating point* or *apex*, and occurs at a point approximately two-thirds of the range from gun to target.

(c) *Cone of fire* (show diagram)

Owing chiefly to gun vibrations, each round in a burst follows a slightly different trajectory. The pattern made in the air is roughly circular and is called the *cone of fire*. The majority of the shots will be in the centre of the cone.

(d) *Beaten zone* (show diagram)

When the cone of fire strikes the ground it forms a long cigar-shaped pattern. This is called the *beaten zone*. At shorter ranges the beaten zone, due to the flatness of the trajectory, is very long and narrow. As the range increases to 2,000 metres the length of the beaten zone decreases, due to the in-

creased trajectory and the steeper angle of descent of the bullet. The width of the beaten zone increases steadily with the range. Should the ground on which the beaten zone falls curve away, the beaten zone will be lengthened. If the ground curves upwards the beaten zone will be shortened.

Effect of trajectory and beaten zone on tactical employment

220. (a) Owing to the flat trajectory of the gun at ranges up to about 600 metres, the machine gun is capable of laying a belt of fire 600 metres long on flat ground, the bullets never rising more than four feet above the ground. This is a valuable asset in defence.

(b) As it is obviously desirable to place the length of the beaten zone along the target when engaging wide targets, machine guns are best sited to a flank where they can employ enfilade fire.

Types of targets

221. Types of targets which machine guns are required to engage are:—

- (a) Point targets.
- (b) Targets with width.
- (c) Targets with depth.

The methods of engaging these types of targets are taught in later lessons.

Conclusion

222. Questions from and to the squad.

223. Sum up.

LESSON 13—INDICATION AND RECOGNITION

INTRODUCTORY

INSTRUCTOR'S NOTES

Training

224. The methods taught in Infantry Training Vol. I, Pamphlet No. 2, Fieldcraft (All Arms), 1954, are the basis of visual training. In the sustained fire role the General Purpose Machine Gun is fired at longer ranges, and owing to the closer grouping of the weapon, even minor inaccuracies in indication and recognition may result in the target being missed. Therefore, the methods taught in Infantry Training, Pamphlet No. 2 need further amplification.

Standard of training

225. The following standard of training must be reached:—

- (a) Officers and NCOs must be capable of:—
 - (i) Organizing an arc of fire.
 - (ii) Preparing and using range cards.
 - (iii) A high standard of indication.
 - (iv) Issuing fire orders.
 - (v) Judging distance up to 2,000 metres.
- (b) Gun numbers must be capable of:—
 - (i) Recognizing quickly and accurately any target indicated.
 - (ii) Indication of simple targets.
 - (iii) Applying fire orders.
 - (iv) Judging distance up to 1,000 metres.

Indication and recognition

226. This lesson should be taught to all officers and NCOs and during practice periods the gun numbers should also be exercised. All personnel should know how to measure in mils by hand angles and should check their own personal hand angles at frequent intervals from every position, i.e., lying down, kneeling, etc. Instruction in recognition must only be given by NCOs who have reached a high standard in indication.

Judging distance

227. The method of teaching judging distance is given in Infantry Training, Pamphlet No. 2, Lessons 2 and 3.

228. Officers and NCOs will be required to pass the following test:—

- (a) Key range two objects not more than 1,000 metres away and not more than 300 metres from a known range.
- (b) Judge distance to two objects, both between 600 and 1,000 metres.
- (c) Key range two objects between 1,500 and 2,000 metres, but not more than 300 metres from known ranges.

For test (a) the error should not exceed 50 metres.

"	"	(b)	"	"	"	"	"	100	"
"	"	(c)	"	"	"	"	"	150	"

Five out of the six ranges must be within the permissible error.

229. Gun numbers should be required to pass tests (a) and (b) only. Three out of four ranges must be within the permissible error.

Fire orders

230. The method of teaching the issue of fire orders is given in Lesson 14.

231. The method of teaching the application of fire orders is given in Part III of this pamphlet, Lesson 26.

Aim

232. (a) To teach how to indicate and recognize targets accurately and quickly.

(b) To teach how to organize an arc of fire.

Class and instructors

233. Lecture—one officer instructor.

Practice—squads under squad instructors.

Periods

234. One 45-minute lecture.

One 45-minute period squad practice.

Stores

235. For lecture: blackboard, chalk, landscape target and target indicator.

For squad practice: gun, tripod, target indicator and squad blackboard.

Preparation

236. For lecture: draw diagrams to illustrate clock ray, use of reference and auxiliary reference points and mils measurement. Draw right and left of arc on landscape target.

For practice period: gun and tripod mounted. Select suitable targets and reference points. The men should check their hand angle measurements before this period begins.

Approach

237. Give the aim of the lesson and emphasize the importance of a high standard of indication and recognition.

Organization of the arc of fire

238. (a) State that an arc of fire is an area of ground over which it is desired that the gun can bring fire to bear from a given position.

(b) Using the landscape target, explain that the arc is defined by a "Right of arc" and a "Left of arc", which are imaginary lines passing through easily defined objects in the landscape on the right and

left of arc. On occasion a "Near limit" is indicated. This implies that only the ground beyond this line and within the arc need be considered.

(c) Ensure the class knows what reference points are. State that reference points will be given short definite names by which they can be rapidly recognised by all gun numbers. Reference points should not be on the right or left of arc, the near limit nor skyline.

(d) Demonstrate on the landscape target how to organize an arc of fire. It is usually done as follows:—

(i) "Look to your front. Half right, large wood—right edge, Right of Arc. Half left, prominent red house—left edge. Left of Arc. Near limit—river running across the front.

(ii) Reference points:—

Axis of arc—church—right bottom corner known as **CHURCH.**

Quarter left—two poplars—right poplar known as **POPLAR."**

Preliminary to indication

239. Tell the class that the fire controller, before indicating a target, will decide on:—

(a) What he is going to call it, ie, what it looks like to the naked eye. A fence may look like a dark strip, a red house in the distance may look black.

(b) The simplest, quickest and most certain method of indication.

Direct indication

240. State that whenever possible the gun itself should be laid on the target to be indicated. If the situation allows it, this is the most efficient method of indication. Alternatively, a target indicator may be used. If the object is unmistakable, the approximate right, axis or left of arc can be of great assistance to denote general direction, eg:—

"Right of arc—White house"

"Axis of arc—Bright yellow patch".

Note:—

During practice periods the use of the gun and target indicator as aids to indication should not be used, to enable maximum practice in other methods to be given.

Reference and auxiliary reference points

241. (a) Show how to indicate targets using reference points. State that auxiliary reference points may be used in conjunction with reference points to indicate difficult targets. They should be easily recognizable and should be close to the target to be engaged.

(b) Tell the class that the last target may be used as an auxiliary reference point if it is near to the new target.

Clock ray method

242. Make sure that the class is conversant with the clock ray method (see Infantry Training Pamphlet No. 2, Lesson 5).

Mils measurement

243. Explain that the distance in mils from a reference point or auxiliary reference point to the target may be of great assistance in indicating a difficult target. Remind them that however the measurement is made, gun numbers can only measure by hand angles.

Targets with width

244. State that when indicating a target with width, the words, "Right limit" and "Left limit" will be used to indicate the extent of the target.

Depth targets

245. State that when indicating a target with depth, the words, "Far end" and "Near end" will be used to indicate the extent of the target.

Failure to recognize the target

246. Explain that if the No. 1 fails to recognize the target, he will call, "AGAIN". The fire controller must then decide whether the No. 1 did not hear the order or whether he failed to understand it. If the fire controller considers that No. 1 failed to understand the indication, he must indicate the target again by a different method.

247. Questions from and to the class.

248. Sum up main points.

Practice

249. Squads under squad instructors:—

(a) Check hand angles of the squad in all positions with a prepared scale.

(b) Practise the squad in organizing an arc of fire. Detail a gun team to take post.

(c) With a target indicator, or the gun, point out a target to the rest of the squad.

(d) When the squad have decided on their indication, order one of them to indicate the target. The No. 1 will lay the gun according to the indication.

(e) Check the aim and discuss the indication given.

(f) Practise the squad as above with all types of targets. The targets selected should be such as to employ the various methods of indication.

Conclusion

250. Questions from the squad.

251. Sum up main points and discuss progress.

LESSON 14—FIRE CONTROL ORDERS

TO BE TAUGHT TO ALL NCOs

Aim

252. To teach NCOs:—

(a) How to give a fire control order.

(b) The various methods used to indicate targets.

Class and instructors

253. One officer instructor.

Periods

254. One 45-minute period.

Stores

255. Blackboard, chalks, drops if available, pointers staff, landscape targets.

Preparation

256. Write the sequence of a fire order on a blackboard.

Approach

257. Give the aim of the lesson.

258. State that the following is the procedure for engaging a target:—

(a) The section comd, by means of a fire order, gives a range and indicates a point of aim on the target.

(b) The firer sets his tangent sight at the range ordered and, by use of the elevating and traversing gear, directs the line of sight on the point ordered.

Issuing fire orders

259. Explain:—

Fire orders are given in a definite sequence, and that the sequence must not be changed. Rigid adherence to the sequence will ensure that errors and omissions are detected immediately and that the gunner, knowing what to expect, will act quickly. The orders must be given loudly and clearly, the section commander facing towards the gun. He must make up his mind what is the correct order to give before embarking on it. Long and unnecessary pauses, during which he is coming to a decision as to the next part of the order, can result only in inaccuracies and slovenly drill.

THE BEST FIRE ORDER IS THAT WHICH GETS BULLETS ON TO THE TARGET IN THE SHORTEST POSSIBLE TIME.

Sequence

260. Point out the sequence of a fire order:—

Designation
Range
Indication of target
Method of fire
Lay
Side wind allowance
Rate of fire
Order to fire.

261. Explain that when giving out the order, pauses should be made as under, until it is seen that the gunner is ready for the next part of the order.

After the range ... To allow time to set sights.

At various stages during indication ... Time must be given for points to be recognised. When a measurement is given in mils, a pause must be made to enable angles to be measured.

After lay ... To enable the gun to be laid.

After wind allowance ... To enable the gunner to manipulate his traversing gear.

Explanation of the headings in the fire order

262. Explain each heading of the fire order as under:—

(a) Range

- (i) Ranges when ordered should be given to the nearest 50 metres and in the following manner:—

900—nine hundred.

1,000—one thousand.

1,050—one owe fifty.

1,200—one two hundred.

1,550—one five fifty.

- (ii) Ranges will normally be obtained by estimation, but once targets have been engaged, subsequent ranges can be key ranged. If the company rangetaker is available, he will make out a range card.

(b) Indication

Targets will be indicated as taught in Lesson 14. Indication should be kept simple, but must be given clearly.

(c) Method of fire

This is dependent on whether the target has width, depth, or neither. It may take any of the following forms:—

- (i) "Right and left—two clicks—lay,"

The gun is laid on the target. When "Fire" is ordered, it is fired and clicked two clicks right and left of the target.

- (ii) "Traversing lay."

The gun is laid on centre of the target. When "Fire" is ordered, the gun is fired and clicked to the right limit first, relaid on the centre and then similarly traversed to the left limit.

- (iii) "Half way up—right and left—two clicks—lay."

The gun is laid half way up the depth of the target. When "Fire" is ordered, the procedure is as for (c) (i) above.

(d) Side wind allowance

- (i) The section commander will calculate the effect of the side wind to the nearest click. It will be ordered to the guns in the following form: "Wind—right (or left) . . . clicks."

- (ii) The No. 1 will apply the number of clicks ordered, note his new point of aim and report, "ON".

- (iii) If no correction is needed, this heading will be omitted from the fire order.

(e) Rate of fire

If no order is given, normal is implied. If it is desired to fire rapid, the order will be given before the order to fire.

(f) The order to fire

This will normally be given by the order, "FIRE".

Orders during a shoot

263. State that the following orders may be given out during a shoot:—

(a) "STOP"

This indicates to the No. 1 that he will stop firing and relay on his noted point of aim.

(b) Ranging corrections

These may be for:—

(i) Direction

The section commander will give the necessary correction in clicks and the No. 1 will note his new point of aim.

(ii) Elevation

The section commander decides on a new range or the correction required and gives it out.

(c) "GO ON"

The No. 1 will continue firing as ordered.

Conclusion

264. Questions from and to the class.

265. Sum up.

LESSON 15—FIRE CONTROL ORDERS—POINT TARGETS**TO BE TAUGHT TO ALL NCOs****Aim**

266. To teach the methods of engaging point targets by direct fire.

Class and instructors

267. One officer instructor.

Periods

268. One 45-minute period lecture.

One 45-minute period practice under squad instructors.

Stores

269. Lecture: blackboard, chalk, landscape targets.

Practice: gun, tripod, drill belt, target indicator, landscape or natural targets, rangetables, squad blackboard.

Preparation

270. Lecture: select suitable targets on the landscape. Prepare blackboards with diagrams as necessary.

Practice: select targets and decide on ranges. Prepare problems to bring out the main points of the lecture.

Approach

271. Give the aim of the lesson.

Point target

272. Explain:—

A point target is a target that appears to the naked eye to have neither width nor depth, although in actual fact it must have both. The limits of a point target are not exceeding eight miles in width and 50 metres in depth. For example, the target may well be an enemy machine gun position covering a width of perhaps five yards. To the gunner, all that may be visible may be a small patch of smoke, or dust blown about near the gun muzzle. The width of the beaten zone may not be wide enough to cover the target.

Method of fire

273. Explain:—

To ensure such types of target are effectively engaged, one click right and left of the initial burst is given. In addition, an extra click right and left is applied to cover possible errors in direction. The rule is, therefore, point targets will always be engaged at all ranges with "Right and Left two clicks". (See Fig 1.)

274. Explain that on the order, "Right and Left, two clicks, lay", the No. 1 will lay on the centre of the target and report, "On". When the order, "Fire", or, "Go on", is given, No. 1 will fire the first burst at the centre of the target, traverse right one click, check aim and fire one burst. Repeat for the next burst. He will then traverse left three clicks, check aim and fire, then left one more click, check aim and fire. When this has been completed, he will re-lay on his noted point of aim and report, "On". This procedure will be applied at each elevation employed.

Errors in elevation

275. Explain:—

If observation of strike is impossible owing to the nature of the ground, then to ensure the target is effectively engaged, errors in elevation are overcome by applying the target engagement rule.

Target engagement rule

276. Explain:—

The application of this rule is dependent upon the range to the target and the

method by which the range is obtained. It is applicable to all types of target, excepting fixed line firing:—

(a) *Ranges not taken by rangefinder, map or registration:—*

(i) *Between 1,000 and 1,500 metres:—*

Estimated range

Drop 50

Add 100

ie, 3 elevations (See Fig 2).

(ii) *Over 1,500 metres:—*

Estimated range

Drop 50

Add 100

Drop 150

Add 200

ie, 5 elevations (See Fig 3).

(b) *Ranges obtained by rangefinder, map or registration:—*

(i) *Up to and including 1,500 metres—One elevation.*

(ii) *Over 1,500 metres —Three elevations.*

277. Illustrate on the blackboard how the bursts cover the point target.

278. Give examples of the engagement of targets:—

(a) *Ranges up to 950 metres.*

(b) *Between 1,000 and 1,500 metres.*

(c) *Over 1,500 metres.*

279. Tell the class that where good observation of strike is possible, the target engagement rule will not be applied, and the method of engaging point targets for line may be reduced to "Right and Left, one click".

Practice

280. Revise the lesson by questions.

281. Practise the squad in the engagement of point targets, as under:—

(a) *Point out a simple target and set the problem.*

(b) *Order the squad to prepare their fire order.*

(c) *Select one of the squad to act as fire controller and give his fire order.*

(d) *On completion of the engagement, get one of the squad to criticize.*

(e) *Discuss the fire order.*

282. Further practice as time permits.

Conclusion

283. Questions from and to the squad.

284. Sum up.

LESSON 16—FIRE CONTROL ORDERS—TRAVERSING TARGETS

TO BE TAUGHT TO ALL NCOs

Aim

285. To teach the method of engaging traversing targets by direct fire.

Class and instructors

286. One officer instructor.

Periods

287. One 45-minute period lecture.

One 45-minute period practice under squad instructors.

Stores

288. Lecture: blackboard, chalk, landscape targets.

Practice: gun, tripod, target indicator, blackboard, landscape or natural targets, rangetables, squad blackboard.

Preparation

289. Lecture: select suitable targets on the landscape. Prepare blackboards with diagrams as necessary.

Practice: select targets and decide on ranges. Prepare problems to bring out the main points of the lecture.

Approach

290. Give the aim of the lesson.

Traversing target

291. Explain:—

A traversing target is a target that appears to the naked eye to have width, eg, a group of bushes, a hedgerow, etc. It may have a different angle of sight at each end, eg, a hedgerow running up the side of a hill, but so long as it has no greater difference than 50 metres in the range to each end, it is a traversing target. The target for a single gun should not exceed 50 mils in width. On completion of the traverse at the first elevation, the No. 1 will report to the section commander the number of clicks required for the full traverse of the target.

Method of fire

292. Explain that the method of engaging a traversing target is as follows:—

The right and left limit of the target will be indicated, followed by the order,

"Traversing, lay". The No. 1 will aim at the centre of the target and report, "ON". When the order, "FIRE", or, "GO ON", is given, the first burst will be fired at the centre of the target. The No. 1 will then traverse in clicks, firing a burst after each until he reached the right limit of the target. He will then add one more click and burst to cover possible errors in direction. He will then relay on the noted point of aim, traverse left one click and fire, then continue to the left limit in the sequence adopted for engaging the right half of the target. Throughout the traverse he will realign his line of sight on to the target after each click. When this has been completed, the No. 1 will re-lay on his noted point of aim and report, "ON". (See Fig 4.) This procedure will be applied at each elevation employed.

293. Errors in elevation will be overcome by applying the target engagement rule. (See para 276.)

Obscuration

294. (a) Explain that when engaging a target that is likely to become obscured, the section commander will order, "STOP", followed by, "PICK UP AIMING MARK". The section commander will measure the width of the target and convert the angle into clicks, adding two for overlap. He will then divide the number of clicks by two and, when ready to continue firing, will order, "Right and Left . . . clicks, Go on". If the No. 1 has determined the number of clicks required to cover the width of the target, this calculation by the section commander will not be required.

Example:—

Estimated range	1100
Target width	32 mils (16 clicks)
Add two clicks for overlap	18 clicks
Order, "Right and Left, 9 clicks".	

- (b) Corrections for elevation will be obtained from the rangetables.

Conclusion

295. Questions from and to the class.

296. Sum up.

297. Further practice under squad instructors in the engagement of traversing targets in the sequence laid down in paras 280 and 281.

LESSON 17—DEPTH TARGETS

TO BE TAUGHT TO ALL NCOs

Aim

298. To teach the method of engaging depth targets by direct fire.

Class and instructors

299. One officer instructor.

Periods

300. One 45-minute period lecture.

One 45-minute period practice under squad instructors.

Stores

301. Lecture: blackboard, chalk, landscape target.

Practice: gun, tripod, target indicator, blackboard, landscape or natural targets, rangetables, squad blackboard.

Preparation

302. Lecture: select suitable targets on the landscape. Prepare blackboards with diagrams as necessary.

Practice: select targets and decide on ranges. Prepare problems to bring out the main points of the lecture.

Approach

303. Give the aim of the lesson.

Depth target

304. Explain:—

A depth target is a target that has a difference in the range to each end of more than 50 metres, but not exceeding 200 metres. Targets of greater depth than 200 metres should not be engaged by one gun. A depth target can take two forms—it can have no appreciable width, or it can have width. In other words, as regards direction, it can either appear as a point or a traversing target. For direction, then, a depth target should be treated as laid down in FCO, Lessons 15 and 16 of this pamphlet.

Method of fire

305. Explain and illustrate:—

The method of engaging a depth target is as follows:—

- The section commander will indicate the limits of the target and order, "Half way up, right and left, two clicks, lay". (See Fig 5.)
- If the target is more than eight mils wide the order will be, "Traversing, lay", because two clicks will not cover the target and allow for errors in direction. (See Fig 7.)
- When the target has been traversed at the first elevation, the section commander will then apply sufficient lifts in the form,

"Drop 50—Add 100", to cover the depth of the target, the gun being traversed along the target at each elevation.

- (d) On a target of no appreciable width, the line of sight will be maintained on the centre of the target throughout. On a target with width, the line of sight will be realigned after each click as the gun is traversed.

306. Illustrate the engagement of the two types of target on the blackboard.

307. Practise the squad.

308. State that if the difference in range between the ends of the target is 150 metres, then the range 50 metres short of the far end should be used as the opening elevation. In this case, to cover the depth of the target, two elevations below the opening elevation will be required and only one above. (See Fig 6.)

309. Point out that when a target is on a forward slope, there will be a difference in the angle of sight between the centre of the target and its ends. In such a case, the beaten zones may not reach to the ends of the target. To ensure that they do so, the section commander should order additional elevations at his discretion.

310. Errors in elevation will be overcome by the target engagement rule, which should be applied if necessary after the depth of the target has been covered. (See para 276.) The total depth of the target is to be regarded as one elevation.

Conclusion

311. Questions from and to the class.

312. Sum up.

313. Further practice under squad instructors in the engagement of depth targets in the sequence laid down in paras 280 and 281.

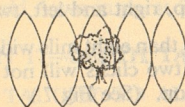


Fig 1

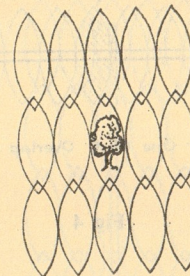


Fig 2

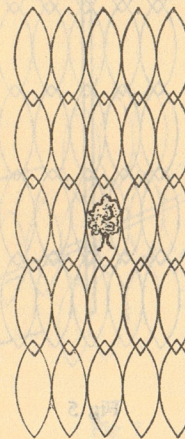


Fig 3

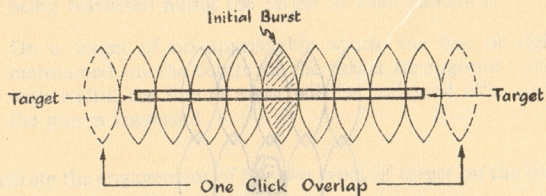


Fig 4

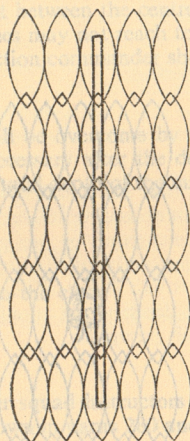


Fig 5

(Depth target—no width)

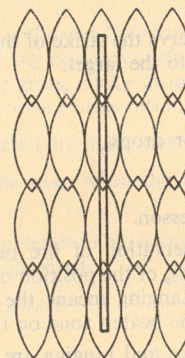


Fig 6

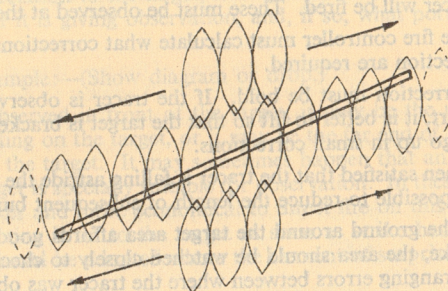


Fig 7

(Depth target—with width)

LESSON 18—OBSERVATION OF FIRE AND RANGING TO BE TAUGHT TO PLATOON COMMANDERS AND NCOs

Aim

314. To teach how to observe the strike of the tracer and from that observation to correct the fire on to the target.

Stores

315. Blackboard, chalk, or drops.

Approach

316. Give the aim of the lesson.

- Explain that observation of fire means the estimation, by the strike of the bullets, of the position of the beaten zone in reference to the target. Ranging means the correction to elevation and direction to lay the beaten zone on the target.
- Observation of fire and ranging are normally carried out by the section commander.
- Under normal circumstances it will be possible to observe tracer at ranges up to 1,100 metres.

Observation of fire—mixed belts

317. Explain:—

- During each burst of 20 rounds, four, and possibly five, rounds of tracer will be fired. These must be observed at the point of strike.
- The fire controller must calculate what corrections in elevation or direction are required.
- Correction must be bold. If the tracer is observed to be falling short, it is better to lift so that the target is bracketted rather than to go up in small corrections.
- When satisfied that the tracer is falling astride the target, it should be possible to reduce the length of subsequent bursts.
- If the ground around the target area affords good observation of strike, the area should be watched closely to check that there are no ranging errors between where the tracer was observed to strike and where the ball ammunition is striking.

Observation of fire at ranges over 1,100 metres

318. Explain:—

- At ranges greater than 1,100 metres the tracer will not assist in ranging. The fire controller must observe the strike of the burst around the target area.
- It may be necessary to fire a burst of more than 20 rounds.

319. The possibility of observation of strike at ranges beyond 1,100 metres will depend on a variety of factors, of which the following are the most important:—

- The nature of the soil around the target.* Sand, dry plough, water, chalk subsoil and any powdery surface generally give good results. Wet ground, long grass, rocky ground—except at short ranges—and undergrowth make observation more difficult.
- Visibility,* as affected by light, mist or mirage.
- The position of the sun;* when the sun is low it is easier to pick up strike.
- Wind;* a high wind tends to blow away the dust caused by the strike before it can be observed.
- The range to the target.*

320. The action of the enemy may indicate whether fire effect is being obtained, eg, the cessation of enemy fire. It should be realised that, in battle, the smoke and dust caused by other weapons will often impede accurate observation. Other guns may also be engaging the same target and it may be difficult for a firer to identify the strike of his own gun. Correct observation of fire can only be accepted when it is definite. No action to correct for elevation or direction must be made if it is uncertain, or no more than probable. Before any deduction can be made regarding the exact position of the beaten zone in relation to the target, it is necessary to decide whether only a small portion of it is giving observation, and, if so, what portion of it.

321. For example:—(Show diagram or drop.)

If strike is observed in front of the target, it may be the near end of the beaten zone falling on the target, or it may be the far end of the beaten zone falling short of the target. It may sometimes happen that an area of ground close to the target is specially suitable for observation. In these circumstances it may be quicker and more economical to direct fire on this area in the first instance, correcting it on to the target as soon as strike has been observed. This method should be adopted where the element of surprise is required.

322. In the engagement of targets with width and depth, when the gun must be switched to cover the target, it will not always be possible to observe the strike of each burst.

323. When observing for strike, it is best to search an area round the target systematically, rather than look at the target.

324. Questions to and from the squad.

Ranging**325. Explain:—**

The centre of the beaten zone must be centred on the target as soon as possible after the first burst. This may entail a correction for direction, or for elevation, or both. The general principles to be observed are:—

- (a) Only correct when it is certain that full fire effect is not being obtained.
- (b) When making corrections, unless the correction required can be determined accurately, over-estimate rather than under-estimate, always provided that the safety of our own troops allows it.
- (c) Always correct for direction first, then elevation.

When the target is on rising ground, the tendency will be to under-estimate the corrections required. Where there is no guide to the amount of correction, the target should be bracketted by making a bold correction, rather than creep towards it by a series of inadequate corrections.

Corrections for line

326. Observation of fire will usually be from the gun position. Corrections can therefore be measured accurately with binoculars or hand angles.

Corrections for elevation

327. It is rarely possible to estimate the exact amount by which the beaten zone is falling over or short of the target. When the whole of the beaten zone can be seen, it will give a useful guide to the amount of correction necessary, as the length of the beaten zone can be found in the rangetables.

Displaced OP

328. When the observer is well to the flank of the gun, it must be appreciated that bullets which are falling over or short will appear to be falling right or left of the target. The observer must visualise the line gun-target and judge accordingly. (Show diagram or drop.)

Reporting strike

329. Strike will be reported by the No. 1 or the No. 2 as follows:—

“Strike on target.”

“No strike.”

“Strike 100 metres short.”

“Strike 100 metres high.”

“Strike . . . miles left (or right).”

330. Questions to and from the squad on ranging.

Conclusion

331. Questions to and from the squad.

332. Sum up.

LESSON 19—PRACTICAL OBSERVATION AND RANGING**Aim**

333. To practise pl comds and NCOs in observation of fire and correction of errors in elevation and direction, and to practise gun numbers in fire discipline.

Stores

334. Guns, tripods, SAA, holdalls, binoculars.

Notes

335. (a) This practice must be conducted on a field firing range.
- (b) Suitable target areas must have been selected which will give reasonable observation of strike.
- (c) With the limited amount of ammunition available for training, it may not be possible to carry out the period. Every opportunity should be taken to practise section commanders and gun numbers whenever live practice is being conducted.

Preliminaries

336. Safety precautions. Order guns and tripods to be mounted.

Approach

337. Give the aim of the lesson. Indicate the arc of fire and reference points.

Observation of strike and making corrections

338. Order, “Load”, and demonstrate as follows:—

- (a) Indicate a point target in an area within the limit of tracer.
Order the squad to watch that area and fire one burst.
- (b) Question squad on strike:—
 - (i) Was it possible to determine the length of the beaten zone?
 - (ii) Was it centred on the target?
 - (iii) What corrections, if any, are necessary?
- (c) Adjust as necessary and continue until the target has been engaged.

Method of practice

339. Instructor's notes

- (a) It is important that every NCO in the infantry is proficient in fire control orders, how to observe strike and apply corrections.
- (b) Gun teams are used merely to fire the gun, carrying out correctly any orders received.

- (c) Ammunition must be used sparingly and as soon as the BZ is on target, the order, "Stop", must be given.
- (d) Targets to be engaged can be indicated by either target indicators, or by using the gun sights. If the latter is used, when the NCO has seen through the sights and is satisfied that he knows the target, the gun will be swung away from the point of aim.
- (e) Split the NCO squad to the number of guns being employed. Each sub squad will be given the problem and NCOs will in turn be ordered to carry out the task.
- (f) On conclusion of each task question the squad on:—
 - (i) Was the target engaged?
 - (ii) Was the fire order given in the correct sequence?
 - (iii) Was it given correctly, ie, clearly, etc?
 - (iv) If corrections were given, were they correct?
 - (v) Was there a waste of ammunition in engaging the target?
- (g) If it is obvious that the NCO is failing to engage the target, stop him at that point and order another NCO to take over.
- (h) Severe criticism should be given at a suitable distance away from the gun team.

340. Practise squad in fire control at point and traversing targets, as ammunition permits, first at ranges up to 1,100 metres, then at greater ranges, providing only that observation of strike is possible.

Conclusion

341. Questions from and to the squad.

342. Sum up.

LESSON 20—FIRE TASKS IN DEFENCE AND ATTACK

TO BE TAUGHT TO ALL PLATOON COMMANDERS AND NCOs

Aim

- 343. (a) To teach how to lay a fixed line as near as is safe to a defended locality by flanking fire.
- (b) To teach how to give the maximum support with safety to our own troops when advancing in the attack.

Preparation

344. Draw the necessary diagrams on the blackboard.

Approach

345. Give the aim of the lesson and state that all preparations for both types of task must be made in daylight.

Protective fire in defence

346. Fire tasks in defence are of two types:—

(a) Fixed lines

The laying of a fixed line across the front of a **FORWARD DEFENDED LOCALITY (FDL)**, in order to give protection during darkness. When laying a fixed line of this type, clicking right and left is not employed.

(b) Harassing fire

The preparation of one or more tasks to engage such areas as cross roads, narrow valleys, bridges, etc, where the enemy are likely to concentrate. In these circumstances it will be necessary to click right and left to cover the width of the target and, where the target has depth, to employ the target engagement rule.

347. Fixed lines can only be selected and laid intelligently if commanders have a thorough knowledge of their use and the characteristics of beaten zones.

348. Advantage must be taken of the flat trajectory and long dangerous space, and this can best be done by siting guns to the flank, thus making an effective barrier from the gun to where the furthest bullet strikes the ground. Guns should be sited low and aimed to cover flat open ground, thus giving an unimpeded path for the bullets.

349. The closer the fixed line is laid to the locality to be protected, the more protection will be afforded, but under no circumstances will the fixed line be closer to our own troops than 60 mils (30 clicks). This allowance will be measured from the position occupied by the forward elements, who may not necessarily be the FDL under protection.

350. (a) *Flanking fire* is governed by two safety rules. **RULE ONE** is: barrels must not point within 60 mils of our own troops. The safety angle must be carefully measured and is best done by using the clicking device on the tripod.

(b) The safety angle allows for:—

- (i) Minor inaccuracies in aiming.
- (ii) Movement of the tripod settling in during firing.
- (iii) Half the width of the beaten zone.
- (iv) Direct crossing winds of 20 mph up to 1,200 metres.

351. If on measuring the 60 mils, it is found that the ground is not suitable, or that trees, banks, etc, are along the line of sight, the distance laid off from the FDL must be increased.

352. The ideal range at which a fixed line should be laid is 600 metres, but it will seldom be possible to get a level and uninterrupted piece of ground at that range. The range limit should be 700 metres, since at ranges beyond this the bullet rises so much above the line of sight that its effectiveness as a barrier is negative.

353. Guns on fixed lines should be defiladed from the front and protected by a forward section.

354. To be effective fire must be produced immediately it is required. A sentry must always be posted near the gun and gun teams must know:—

(a) The signal for defensive fire.

(b) The rate of fire to be employed.

355. Fixed lines are usually co-ordinated by the Bn Commander through the defensive position and given in his fire plan.

Harassing fire

356. There will be many occasions when it will be necessary to engage area targets, such as bridges, cross roads, etc. When engaging targets of this type the clicking device will be used to cover the width of the target. Where it has not been possible to register the target by firing, the target engagement rule, as applicable to ranges obtained by estimation, must be applied. At ranges up to 950 metres fire controllers must be prepared to add extra elevations. This will ensure that targets at all ranges are effectively covered by fire. The drills used to engage targets of this nature are taught in Part III of this pamphlet.

Supporting fire in the attack

357. Guns can be used to give support to our own troops when advancing in the attack. Gun teams detailed for this role must always select a position on the flank of the line of attack.

358. (a) Providing the ground over which the attack is to be made can be seen by the section commander, a distance of 60 mils will be measured from the near limit of the target to be engaged. This will be the safety limit and firing must be stopped immediately our own troops have reached that line.

(b) The possibility of observing the movements of our own troops will depend on various factors, eg, the nature of the ground, whether open or close, flat or hilly, and obstruction of the field of view (bad visibility, smoke screen, etc). Since such observation can hardly be assured, it is evident that considerable caution will have to be exercised.

(c) If the ground cannot be seen, either a timed programme must be used or some system of signalling must be employed.

359. RULE ONE for flanking safety is also applicable when giving supporting fire in the attack, and RULE TWO is: the position of own troops must be known, or they must be working to a timed programme.

360. It is essential that members of the gun team should clearly understand the rules of safety, and as much practice as possible must be given in this subject.

Conclusion

361. Question the class.

362. Sum up.

LESSON 21—THE CONSTRUCTION OF RANGE CARDS

TO BE TAUGHT TO ALL NCOs

Introduction

363. Explain:—

Tracer ammunition will give observation of strike up to a range of 1,100 metres. Ball may be used up to 2,000, providing observation of strike is possible.

Ranging is the most accurate method of ensuring fire effect, and should be used whenever possible.

364. The range to a target may be determined by:—

(a) Rangefinder.

(b) Measurement on a map of not less scale than 1/25,000. The map must be in good condition and the target and gun position accurately located.

(c) Key ranging by estimating from ranges taken by either of the above methods.

Rangefinder

365. As much use as possible must be made of the company rangetaker when a new position is to be occupied. A number of ranges should be taken on prominent objects within the arc of fire and a range card constructed. Ranges should be taken from about 800 metres up to a maximum of 2,000 metres.

366. To make out a range card:—

- (a) Describe accurately the point from which the card is made out.
- (b) Put in the range that each circle is to represent.
- (c) Choose one unmistakable object at the longest range and draw a thick setting line to it.
- (d) Decide on the objects you want to record the ranges to—these to include positions that the enemy are likely to occupy.
- (e) Set the card by the setting ray and draw lines in the direction of all the other objects.
- (f) Against the position of each object print a short description of how it looks to the naked eye and the range to it.
- (g) Complete "Method of obtaining range", and sign and date the card.

367. All NCOs should now be practised in making out range cards.

LESSON 22—RANGE TABLE AND FIRE CONTROL CHARTS

Aim

368. (a) To teach the fire controller the use of the range tables.
(b) To teach the use and method of compiling fire control charts.

Class and instructors

369. Squads under squad instructors.

Periods

370. Two 45-minute periods.

Stores

371. Part I—blackboard, chalk and range tables.

Part II—blackboard, chalk, range tables, landscape targets, gun, tripod and dial sight, fire control charts.

Preparation

372. Part I—prepare problems.

Part II—mount gun, select targets and prepare fire control charts.

Approach

373. Give the aim of the lesson (see para 368 a.).

Range tables

374. The instructor should explain the range tables as described in this lesson and set simple exercises in them until the class is thoroughly familiar with them.

- (a) Columns 1 and II give the ranges in 50's from 500 to 2,000 metres.
- (b) Column 2 gives the tangent angle.
- (c) Column 3 gives the lift for 50 metres, ie, the angular amount by which each elevation has to be increased so as to add 50 metres to the range.
- (d) Column 7 gives the number of elevations required by the target engagement rule for the different methods by which the range is determined (see Lesson 15).
- (e) Column 8 gives the time of flight at each range.
- (f) Columns 9 and 10 give the width and length of the beaten zone. The figures given are for 90 per cent of the total shots fired. The stray shots, which produce little fire effect, are therefore not included. The length of beaten zone is that along the line of sight.

375. Wind—winds blowing directly along the line of fire from front to rear will affect the elevation, but unless the wind is very strong and the range long, the allowance required is small. As the range is limited to 2,000 metres, and winds of up to 30 mph have little effect on the bullet, no allowance is necessary. Winds blowing directly at right angles to the line of fire will affect direction and have considerable effect on the bullet, particularly at the longer ranges. Winds blowing obliquely to the line of fire will also affect direction. The amount by which they affect elevation is small and is therefore ignored. Having estimated the strength and direction of the wind, the allowance required is obtained from the range table (see columns 4 to 6).

376. Example:—

Range	—	1,400	
Wind direction	—	from 5 o'clock	
Speed	—	15 mph	
Allowance required for	10 mph (coln 6)	=	3 miles
"	5 "	=	1½ "
		Total	= 4½ miles

When applied on the tripod deflection drum in direct fire, order, "Right, 2 clicks".

When applied on the dial sight, order, "Right, 5 mils".

377. Practise the squad in line corrections to cater for varying wind speeds at various ranges.

PART II

Approach

378. Give the aim of the lesson (see para 368 b.).

Fire control charts

379. Explain:—

For the conduct of programme shoots when fire is required at stated periods on one or more targets, it will generally be preferable to prepare fire control charts for the control of fire. Such charts are usually desirable when shooting at night.

Compiling fire control charts

380. Explain:—

Fire control charts are made up by section commanders. They are prepared from data obtained during daylight preparation of a night task (see Lesson 29).

381. Explain each heading of the fire control chart. The chart contains the actual detail of switches, timings and rates of fire, the elevations and number of clicks for direction for each target.

382. It must be borne in mind that the elevation recorded will not necessarily coincide with the tangent elevation for the range ordered (see coln 2 of the range tables). The reason for this is that the angle recorded will include the angle of sight to the target, which may be above or below the horizontal plane, giving respectively a greater or smaller angle than the tangent angle for the range.

383. Lifts for 50 metres must be calculated to the nearest mil (see coln 3 of range tables), eg, from 500 to 950 a lift of 50 metres requires 1 mil; from 1,000 to 1,700 requires 2 mils, and from 1,750 to 2,000 requires 3 mils.

Example:—

Range to target (estimated)	1,200 metres
Elevation recorded	+ 22 mils
Number of elevations to be employed ...	3
Therefore, opening elevation is	+ 22 mils
Second elevation (drop 50)	+ 20 mils
Third elevation (add 50)	+ 24 mils

384. If working to a timed programme, time must be allowed in the chart for lifts and switches to be put on the gun. At night a pause of 30 seconds should be allowed for each lift and 60 seconds for each switch.

385. Practise the squad in compiling fire control charts.

386. FIRE CONTROL CHART

No. of Task	Clock Time		H Time		Angle of Elevation	Angle of Direction	No. of Elevations		Numbers of Clicks R and L	Rate of Fire	No. of Belts
	From	To	From	To			In Metres	As an Angle			
1	0130	0140	H	H + 10	+30	350	—	—	2	R	10
2	0200	0215	H + 30	H + 45	+40	455	D50	+38	3	N	8
3	0245	0255	H + 75	H + 95	+32	285	U100	+42	2	N	10
							D150	+36			
							U200	+44			
							D50	+30			
							U100	+34			

Date:

(Sgd)

Commanding No. Section

PART III—SUSTAINED FIRE ROLE

CHAPTER 4

GUN DRILLS

INTRODUCTION

Safety precautions

387. Safety precautions must always be carried out correctly. This is particularly important in this role, when there will be many occasions when the No. 2 will be in front of the gun, setting up the aiming post and lamp.

Distribution of guns and stores

388. The scale of issue of conversion kits will be three per company. The present policy is that they will be drawn as and when required by the section which has been detailed to take on a sustained fire role. The following stores are required for use in this role:—

One holdall containing:—

Two heavy barrels
Recoil mechanism
Return spring
Barrel level checking
Dial sight.

One holdall containing:—

Tripod
One set pegs night line
Aiming post
Range tables
Recoil buffer
One pair asbestos gloves
Dial sight bracket.

In addition:—

Aiming lamp.

Ammunition

389. The backing of ammunition for the sustained fire role will be 5,000 rounds. The section commander will draw sufficient ammunition to meet immediate needs, but should bear in mind that the Nos. 1 and 2 will not be able to carry more than three belt boxes in addition to the conversion kit. Any extra ammunition will have to be carried by riflemen to the gun position.

LESSON 23—TRIPOD 1

Aim

390. To teach how to mount and dismount gun and tripod.

Stores

391. Guns, tripods, belts and belt boxes, holdalls.

Preliminaries

392. Safety precautions. Mount the tripod in the normal position.

Approach

393. Give the aim of the lesson. Explain that No. 2 will mount and dismount the tripod and No. 1 the gun.

Description

394. Explain:—

(a) The tripod legs are held in position by clutch plates and secured by clamp levers. On the bracket at the pivot point of the legs there is a direction dial. This is in mils to 3,200 right and left. It is marked in 1,000s and sub-divided in 250s. The dial can be rotated freely, and a pointer on the underside of the cradle indicates the angle of the gun in relation to the dial.

(b) A cradle is fitted to the bracket by a ball and socket joint. This is secured by the cradle locking lever. The cradle is buffered to absorb the recoil of the gun during firing. The gun is secured to the forward end of the cradle by a mounting pin. The rear mounting pin is fitted into the rear mounting seating on the gun.

(c) A deflection drum is fitted to the right rear of the cradle; it is used to obtain adjustment in direction.

When the drum is pulled outwards the clicking device is brought into operation; each click is equal to two mils.

When the drum is pushed inwards the clicking device is taken out of operation.

(d) Adjustments for elevation are obtained by rotating the elevating drum on the left rear of the cradle. The clamp lever must first be released.

(e) On the left bar of the cradle there is a dovetailed slot to take the dial sight bracket.

To fit the bracket unscrew the wing nut and slide the bracket on from the rear. Ensure it is fully forward and tighten the wing nut.

395. Question the squad. Dismount tripod.

Mounting the tripod on level ground

396. Demonstrate and explain:—

- (a) With the tripod legs to the rear, straddle the tripod. Grasp the front bar of the cradle and lift the tripod until vertical. Grip the cradle between the thighs and unlock both clamp levers. Lift the right leg until it is in the low position, as marked by the mounting marks, and lock the lever. Repeat with the left leg and lower the tripod and stamp the shoes firmly into the ground.
- (b) Release the cradle locking lever and lift the rear of the cradle upwards until horizontal, secure the locking lever and pull out the front mounting pin. If necessary, rotate the direction drum until the elevating gear is central on the traversing bar.

Mounting the gun

397. Ensure that the ejection cover is closed. Lift the gun and, ensuring that the flats on the rear mounting pin are correctly positioned, push the gun fully forward and insert the front mounting pin; fold and lock the bipod legs, remove the butt and fit the recoil buffer.

Dismounting the gun

398. Release the bipod legs and pull out the front mounting pin. Draw the gun off the tripod to the rear. If the gun is to be fired in the light role, replace the butt.

Dismounting the tripod

399. (a) Push in the front mounting pin. Ensure that the rear leg is in the low mounting position.

Release the cradle locking lever, depress the rear of the cradle and lock.

- (b) Straddle the tripod and lift to the vertical position; unlock both front leg clamp levers and allow the legs to drop. Grip the cradle between the knees, ensure that both front legs are in line with the rear leg and clamp firmly. Lay the tripod on the ground.

400. Practise squad in pairs. Last pair will leave the gun mounted. The words of command to be used are, "Mount gun" and "Dismount gun".

Loading and position of gun numbers

401. Explain and demonstrate as necessary:—

- (a) Ammunition to be used in the sustained fire role will be carried in a belt box.
- (b) No. 2 will place the box on the left of the tripod with the quick release catch of the lid towards the tripod.

- (c) The No. 1 will adopt a position to the left of the gun, left hand on the pistol grip, right hand holding the direction drum. The No. 2 should position himself on the left of No. 1 and in such a position that he can perform such duties as loading, observing fire, etc.

- (d) On the order, "Load", No. 1 will open the top cover, the No. 2 will open the belt box and position the belt as taught.

- (e) No. 1 will close the top cover.

Unloading

402. Explain and demonstrate:—

On the command, "Unload—Clear gun", carry out the actions as taught. No. 2 will replace the belt in the box and secure the lid.

Both numbers will stand up and No. 1 will report, "Gun clear".

Explain that the gun must always be unloaded before it is removed from the tripod.

403. Practise the squad.

Conclusion

404. Questions from and to the squad.

405. Sum up.

LESSON 24—TRIPOD 2—MOUNTING THE GUN ON UNEVEN GROUND BEHIND COVER

Aim

406. To teach how to mount the gun on uneven ground behind various types of cover.

Stores

407. Gund, tripods, belts and belt boxes, holdalls.

Preliminaries

408. Safety precautions.

Approach

409. Give the aim of the lesson.

Instructor's notes

410. (a) Ground must be selected that gives a wide range of problems for practice.

- (b) Insist at all times that the direction dial on the head of the tripod is level.
- (c) The long leg should be to the rear, except when the tripod is mounted on a forward slope, or on the side of a bank, when the long leg should be pointed down the slope.
- (d) It may be necessary to put filled sandbags, or pieces of turf, on the shoes to ensure stability of the tripod.
- (e) Practice should be given in mounting the gun behind cover; check the amount of exposure by sending half the squad forward to view from the front. The rest of the squad should act as critics.

Mounting the gun on uneven ground

411. Explain that when the gun is mounted the following conditions must be fulfilled:—

- (a) The gun must be mounted as low as possible consistent with obtaining good observation of the target area.
- (b) To check that the fire will clear the crest of the cover, lower the head until the eye can follow the line of the barrel.
- (c) The gun numbers must adopt positions which will give the minimum exposure.

412. Practise squad in mounting the gun on various types of ground.

Conclusion

413. Questions from and to the squad.

414. Sum up.

LESSON 25—SIGHTSETTING, AIMING AND FIRING

Aim

415. To teach the drill for sightsetting, aiming and firing.

Stores

416. Guns, tripods, drill belts, belt boxes, wallet, landscape or natural targets.

Preliminaries

417. Safety precautions. Order guns to be mounted and loaded.

Approach

418. Give the aim of the lesson.

Sightsetting

419. Explain and demonstrate:—

For ranges over 800 metres the sight will be raised to the vertical position. Graduations are in 100s of metres, sub-divided in 50s. Whenever the cover is opened the sight must be folded down. On the range being ordered, No. 1 will set the sights as taught, cock the gun and put the safety catch to safe. AIMING—ROUGH ALIGNMENT—Order, "Mount gun" and, "Load".

420. When the target is indicated, rough alignment is obtained by releasing the cradle locking lever. This can be done by the No. 2. No. 1 will order, "Unlock". When the No. 1 is satisfied that his aim is approximate to the target, he will call out, "Lock". The No. 2 will push home the locking lever.

Fine adjustment—elevation

421. To elevate or depress the gun, release the clamp lever and rotate the elevating drum until the sights are in line for elevation. Tighten the clamp lever.

Fine adjustment—direction

422. Push in the deflection drum and turn the drum until the sights are in line for direction. It may be necessary at this stage to make a final adjustment for elevation. When satisfied that the aim is correct, pull out the deflection drum. This action engages the drum into the clicking device. Report, "On".

423. Practise the squad.

Length of burst and rates of fire

424. (a) The normal length of burst will be 20 rounds.

(b) When it is possible to observe strike, the length of the burst can be reduced to 10 rounds. Tracer will afford good observation up to about 1,100 metres.

(c) The normal rate of fire will be about half a belt per minute.

(d) Rapid fire will be about one belt per minute.

425. Further practice as necessary.

Barrel changing

426. If long periods of rapid fire are to be employed, the barrel should be changed after four belts have been fired.

(a) When the fourth belt has been loaded No. 2 will indicate, "Fourth belt".

(b) When the belt has been expended No. 1 will apply IA drill, cock the gun and order, "Barrel". No. 2 will change the barrel.

(c) Re-load and carry on firing.

Conclusion

427. Questions from and to the squad.

428. Sum up.

LESSON 26—APPLICATION OF DIRECT FIRE ORDERS

PART I

Aim

429. To teach the soldier how to act on the various parts of a direct fire order.

Stores

430. Guns, tripods, drill belts, wallet, landscape or natural targets, blackboard.

Periods

431. This lesson will be taught in three separate periods. Each period will be followed by as many practice periods as are considered necessary to ensure that the gun numbers are fully conversant with the drills.

Preparations

432. The instructor should select targets of various types and decide on ranges before the lesson begins.

Preliminaries

433. Safety precautions. Order the gun to be mounted facing the arc, and load. Organize the arc of fire and order the gun team to fall out.

Approach

434. Give the aim of the lesson.

435. Using the blackboard, show the sequence of a direct fire order:—

- (a) Designation.
- (b) Range.
- (c) Indication of target.
- (d) Method of fire.
- (e) Lay.
- (f) Side wind allowance.
- (g) Rate of fire.
- (h) Order to fire.

Types of target

436. Explain that there are three types of target. These are, point, traversing and depth targets. Part I of this lesson deals with point targets only.

Point target

437. Explain and demonstrate on blackboard:—

A point target appears to the naked eye to have no appreciable width. The limits of a point target are not exceeding eight mills in width and 50 metres in depth.

438. (a) Detail gun teams.

(b) State that a point target is always engaged with right and left two clicks to ensure it is hit. Explain how the No. 1 applies, "Right and left, two clicks". (See Lesson 15.)

(c) Explain that the side wind allowance is always given in clicks.

439. Give a fire order on to a point target and explain the duties of No. 1 at each stage of the order:—

Order	Action of No. 1
(a) Designation	—Gunner is alerted.
(b) Range	—Sets sight, cocks gun.
(c) Indication	—Recognizes the target.
(d) Right and left, two clicks, lay	—Gives warning of the method of fire to be employed. When the gun has been laid the No. 1 reports, "ON".
(e) Wind right (or left) . . . clicks	—Applied on the tripod traversing drum, No. 1 notes new point of aim and reports "ON".
(f) Rate of fire	—(i) If "RAPID" is ordered, he then prepared to fire rapid. (ii) If none is mentioned, he then knows that the normal rate is required.
(g) Fire	—Presses the trigger and fires the normal length of burst.

440. State that the No. 2 must at all times be prepared to take over as No. 1. He must therefore know the range on the gun, the target and wind allowance.

441. If at any time the No. 1 fails to understand an order, he will call, "AGAIN".

Firing drill—point target

442. Explain:—

- (a) When the order, "FIRE", or, "GO ON", is given, the No. 1 will adopt the following sequence of actions:—
- Fire the first burst at the centre of the target.
 - Traverse right one click, check aim, fire one burst.
 - Repeat (2) above for next burst.
 - Traverse left three clicks, check aim, fire one burst.
 - Traverse left one click, check aim, fire one burst.
 - Relay on the noted point of aim and report, "ON".

This procedure will be applied at each elevation employed.

- (b) On the order, "STOP", the No. 1 will stop firing and always relay on the noted point of aim.
- (c) If it is necessary to engage the target again, the section commander must ensure the original range at which the target was engaged is ordered, followed by, "GO ON".

443. Practise the squad in engaging point targets.

Conclusion

444. Questions from and to the squad.

445. Sum up.

PART II**Traversing target**

446. (a) Explain:—

A traversing target appears to the naked eye to have width. The difference in range to each end must not exceed 50 metres, and it should not be more than 50 mils wide.

- (b) Explain the method of engaging a traversing target. (See Lesson 16.)
- (c) State that on the order, "Traversing, lay", the No. 1 will lay on the centre of the target and report, "ON". Emphasise that when firing the line of sight is realigned on to the target after each click.

Firing drill—traversing target

447. Explain:—

- (a) When the order to "FIRE" or "GO ON" is given the first burst will be fired at the centre of the target. The No. 1 will then traverse in clicks to the right limit of the target, checking the aim between each burst. When the right limit is reached, one extra click and burst will be given. He will then relay on the noted point of aim and similarly engage to the left limit. When this has been completed the No. 1 will relay on his noted point of aim, and report, "ON". This procedure will be applied at each elevation employed.
- (b) On the order, "STOP", the No. 1 will stop firing and will relay on the noted point of aim.
- (c) For re-engagement of the same target, see para 442 c.
- (d) The number of clicks used to cover the whole width of the target will be counted by the gunner, who will report the result to the section commander on completion of the first elevation.

448. Practise the squad in the engagement of traversing targets.

Conclusion

449. Questions from and to the squad.

450. Sum up.

PART III**Depth targets**

451. (a) Explain:—

A depth target has a difference in range to each end of more than 50 metres, but not exceeding 200 metres. It may, or may not, have width.

- (b) Explain the method of engaging a depth target. (See Lesson 17.)
- (c) Explain that the method of fire will be either, "Half way up, right and left, two clicks, lay", or, "Traversing, lay", depending on whether the target has width or not. On either order, the No. 1 will lay half way up the target and report, "ON". When firing, if "Half way up, right and left two clicks, lay" has been ordered, the No. 1 will maintain his point of aim half way up throughout the engagement. The drill of firing will be as for a point target. If "Traversing, lay" is ordered, the No. 1 will realign his point of aim on to the target after each click. The drill of firing will be as for a traversing target.

- (d) The section commander will apply sufficient lifts in 50s of metres in the form, "Drop 50—Add 100", etc, to cover the depth of the target.
- (e) On the order, "STOP", the No. 1 will stop firing and will relay on the noted point of aim.
- (f) For re-engagement of the same target, see para 442 c.

452. Practise the squad in the engagement of both types of target.

Conclusion

453. Questions from and to the squad.

454. Sum up.

LESSON 27—DIAL SIGHT

Aim

- 455. (a) To teach the method of setting up the aiming post and lamp.
- (b) To teach the parts of the dial sight, how to manipulate them, and how to aim with the sight.

Stores

456. Guns, tripods, aiming posts, aiming lamps, landscape or natural targets.

Periods

457. A minimum of three periods will be required to teach and practise this lesson.

Preliminaries

458. Safety precautions. Order guns to be mounted.

Approach

459. State the aim of the lesson.

Aiming post

460. Describe the aiming post, point out the adjustable arm, the aiming mark, bracket for lamp and the supporting extension. Demonstrate how to erect the aiming post—first in the vertical position and then lying on its side.

461. Practise the squad.

Aiming lamp

462. (a) Describe the components of the lamp, and point out the coloured disc for toning down the light.

(b) Explain and demonstrate:—

- (i) Remove the lamp from the box and pass the cable through the slot in the side of the box. Connect the leads to one of the batteries.
- (ii) Secure the lamp to the extension above the aiming mark with the bracket uppermost. Tighten the wing nut.
- (iii) Close the box and place it close to the aiming post with the switch ring facing the gun. To secure the box to soft ground release the hook from its securing strap and stamp the hook into the ground. If the ground is hard, use the securing chain to anchor the box to a post or other firm object—not to the aiming post.
- (iv) Remove the reel from the box and clip the swivel hook through the switch ring. Run the line back to the gun.
- (v) The lamp is switched on and off by pulling on the line.

463. Practise the squad in setting up the aiming post and lamp.

Dial sight

464. Explain:—

The dial sight is used to maintain elevation and direction. It is used when firing at night or by day when the target is obscured by fog or smoke.

465. Explain and demonstrate:—

(a) *Telescope*

This is mounted at the top of the dial sight and can be moved up or down, and when in the desired position, it can be locked by a clamp lever. The eyepiece can be rotated so that the open sight can be used for rough alignment. There is a dovetailed seating on the right of the telescope, to which the sight illuminating lamp can be fitted.

(b) *Deflection dial*

The deflection dial is graduated in 100s of mils from 0–6,400. It is numbered every 200 mils in a clockwise direction. The scale ring can be rotated independently by unscrewing the clamp. Before use the scale ring must be set at zero. Unscrew the clamp and turn the scale until "0" is in line with the upper zero mark. The lower zero mark is used to record angles of deflection over 100 mils.

(c) *Deflection drum*

The deflection drum is graduated in single mils from 0–100 and is numbered every 10 mils. The scale ring can be moved independently by releasing the wing nut on the end of the drum. Before use the scale ring should always be set with "0" opposite the outer zero mark. The inner zero mark is used to record angles of deflection and must be read in conjunction with the deflection dial.

(d) Quick release

The deflection dial can be rotated by pushing forward the deflection drum. Care must be taken to ensure the drum is held fully forward before rotating the dial.

466. Practise the squad in setting deflections.

467. Explain and demonstrate:—

(a) Elevation scale

There are two scales. The one to be used in connection with the GPMG is situated at the rear of the sight. It is graduated from minus 200 to plus 600 in 100s of mils and is numbered every 200 mils. There is a zero mark on the body of the sight to record angles of elevation over 100 mils.

(b) Elevation drum

This is graduated in single mils from 0–100 and numbered every 10 mils. There is a zero mark which is used when recording angles of elevation, and it should be read in conjunction with the main scale.

468. Practise the squad in setting elevations.

469. Point out the two levelling bubbles.

Fitting and removing the dial sight

470. Demonstrate:—

Insert the sight bracket into the tripod bracket, press down on the sight catch and push the sight fully down. To remove the sight, press down on the sight catch and lift up the sight.

471. Practise the squad.

Aiming

472. Explain and demonstrate:—

The telescope is used only for maintaining direction. To aim, look through the telescope with the eye close up to the rubber eyepiece. Adjust the telescope for height if necessary and traverse the gun until the centre of the crosswires is central on the aiming mark.

473. Practise the squad.

Laying the gun

474. Order an elevation and deflection to be set on the sight.

475. Explain and demonstrate:—

(a) Look through the telescope, adjust for height if necessary and traverse the gun towards the aiming mark. If the distance to be traversed is great, order No. 2 to "Unlock" the cradle locking lever and when the aim for direction and the elevation bubble are approximate, order him to "Lock". Then make final adjustment for line.

(b) When the aim for direction is correct, make the final adjustment for elevation on the tripod elevating drum and ensure the bubble is central. Lock the elevating drum.

(c) Finally, check that the aim through the telescope is correct.

(d) The gun is now laid for elevation and direction.

476. Practise the squad.

Dial sight lamp

477. Explain and demonstrate:—

This consists of a battery box, an on/off switch at one end and two leads. The bulb attachments are fitted to the sight as follows:—

(a) Slide the dovetailed attachment on to the seating on the telescope from front to rear, so that the glass inserts are directly opposite each other.

(b) One arm of the "Y" shaped attachment is fitted into the rear seating from the left, ensuring that the long groove on the arm is in line with the small stud inside the seating.

(c) The single attachment is put into the front of the seating above the deflection drum and pushed fully home, again ensuring that the long groove is in line with the stud inside the seating.

478. Practise the squad in fitting the lamp attachments.

Packing the sight

479. Explain and demonstrate:—

To pack the sight into the sight box, press forward the deflection dial quick release and rotate the upper part of the sight until the rubber eyepiece is directly over the sight bracket. Put the sight in the box with the eyepiece downwards.

480. Practise the squad.

Conclusion

481. Questions from and to the squad.

482. Sum up.

When the target is visible

494. Explain that when the target can again be seen No. 1 will act on the section commander's orders, as taught. The No. 2 will collect the aiming post on cease fire being given.

Conclusion

495. Questions from and to the squad.

496. Sum up.

LESSON 29—PREPARATION FOR NIGHT FIRING**Aim**

497. To teach the section the drill for engaging targets at night.

Stores

498. Gun, tripod, drill belts, belt boxes, holdalls, dial sight, aiming post and lamp, torches, fire control charts.

Preliminaries

499. Safety precautions. Order the gun and tripod to be mounted.

Approach

500. Give the aim of the lesson. Explain that it will soon be dark, and the section is required to engage one or more targets during the night. Indicate the target.

Preparation

501. (a) On the range being ordered and the target being indicated:—

(i) No. 1 will set the range on the tangent sight and aim at the target.

(ii) The section commander and No. 2 will check both range and aim.

(b) On command, "Out, aiming lamp":—

(i) No. 2 will set up the aiming post and aiming lamp about 10 metres from the gun and at an angle of about 800 mils to the line of fire.

(ii) No. 1 will put on the dial sight and fit the illuminating attachments.

He will level the bubble by rotating the sight elevation drum.

(iii) The telescopic sight will be aimed at the black spot in the centre of the lamp, using the deflection dial and drum.

(iv) The section commander will carefully record the elevation and deflection for each task and prepare details on a fire control chart.

(c) On command, "Load":—

(i) Load as taught.

(ii) No. 2 will ensure that all belt boxes and the holdall are within easy reach.

(iii) No. 1 will once more check aim, report, "ON", and fire as ordered.

(iv) The drill of firing will be as in para 488.

(v) If any wind allowance is ordered, No. 1 will apply it to the dial sight and then relay the gun on to the aiming mark by using the deflection drum on the tripod and report, "ON".

502. Practise the squad in pairs.

Engagement of targets

503. The section commander will:—

(a) Prepare a fire control chart giving details of each task.

(b) Make any allowance for wind at the gun before firing commences.

504. Apply the target engagement rule.

505. Practise the squad in the engagement of targets by night from a prepared fire control chart.

Conclusions

506. Explain that once the preparation for firing has been completed the gun must never be left unattended.

507. Questions from and to the squad.

508. Sum up.

LESSON 30—FIXED LINES—PROTECTIVE FIRE**Aim**

509. To teach:—

(a) How to lay fixed lines to protect our own troops.

(b) The actions to carry out on the signal to open fire.

Stores

510. Gun holdalls complete, dial sight, aiming lamp, drill belts and belt boxes.

Instructor's notes

511. (a) Areas of ground suitable for fixed line firing must be selected prior to teaching this lesson.

(b) Simple situations should be depicted and the FDLs pointed out to section commanders.

(c) There are two drills:—

(i) Where the gun team occupies the fixed line position just before darkness and prepares the task.

(ii) Where the task is prepared during the day, but the team is required to resume its light role task until dark.

(d) For reference and ease of instruction, the first drill will be headed, "Preparing a fixed line at dusk". The second drill will be headed, "Preparing a fixed line during daylight".

Preparing a fixed line at dusk

512. Safety precautions. Check contents of the holdalls.

From behind cover indicate:—

(a) The FDL to be defended.

(b) The position where the gun and tripod are to be mounted.

Approach

513. Give the aim of the lesson.

Preparation

514. The section commander will:—

(a) Order the gun to be mounted on the position previously indicated.

(b) Indicate the point on the FDL from which the safety angle will be measured, give the range and order the gun to be laid on that point.

(c) Check the range and aim.

(d) Order, "Right (or left)—30 clicks", and when this has been done check through the sights that there are no obstructions along the line of sight and that the ground is reasonably level. It may be necessary to lay at a point more than 30 clicks to ensure that the task can be performed satisfactorily.

(e) Order, "On dial sight", followed by, "Out, aiming lamp". The drills as previously taught in para 501 (b) (i) to (iii) will now be carried out by the Nos. 1 and 2.

(f) Check that the telescopic sight aim is correct and the elevation bubble central.

(g) Record all details.

515. The No. 2 will ensure that all the stores are present and the gas setting of the second barrel is adjusted to the correct setting. Ammunition will be placed on the left of the gun.

516. Order, "Load".

517. All members of the section must know the pre-arranged signal, which indicates that fire is urgently required.

518. Practise the squad in pairs.

Firing

519. Explain:—

(a) During the hours of darkness a sentry will be posted beside the gun.

(b) The gun will be fired only on the pre-arranged signal.

(c) When the signal is given, fire will be at the rapid rate.

(d) Barrels should be changed after four belts.

(e) The gun will be fired only at the recorded line and elevation.

520. Question the squad.

Preparing a fixed line during daylight

521. Explain:—

There will be occasions when the gun numbers are unable to occupy the fixed line position during dusk light, ie, the gun being required in its light role until darkness, and the tripod cannot be left in position. Preparations must then be made at some time during the day.

Preliminaries

522. (a) The section commander will detail one man to collect the following items from company HQ: tripod, dial sight and pegs night line.

(b) The No. 1 of a gun being used in the light role will be ordered to accompany the section commander to the fixed line position.

Preparation

523. The drill for laying the fixed line with the gun sights will be as taught. When this drill is completed the following actions will be taught:—

- (a) No. 1 will be ordered, "On dial sight", followed by, "Zero dials".
- (b) When this has been done the No. 1 will centralise the elevation bubble, using the sight elevation drum.
- (c) No. 2 will take the pegs night line forward of the gun and No. 1, using the telescopic sight, will direct the first peg to be put in, in line with the target. This peg should be at least five metres from the gun.
- (d) The second peg will be put in at some distance further away from the gun.

Note

524. The pegs should be clearly visible to the No. 1. Avoid long grass, etc. They should not be too close, but the distance will depend on the ground in front of the gun. It may be necessary to elevate or depress the telescopic sight to permit an aim to be laid.

525. The section commander will check:—

- (a) The aim of the gun sight.
- (b) The elevation bubble.
- (c) Record the reading for elevation.
- (d) The line of the pegs through the telescopic sight.

Locating the tripod position

- 526. (a) No. 1 will remove the gun from the tripod, taking care that the tripod is not moved.
- (b) With his eye close to the hole in the tripod head, he will position the bobbin on the ground and in line with the hole. Holding the bobbin firmly, he will order No. 2 to remove the tripod.
- (c) He will insert the short peg through the hole of the bobbin and drive the peg firmly into the ground.

527. Practise the squad in pairs.

Occupation of the position during darkness

528. Explain:—

- (a) Before occupying the position the complete conversion kit must be collected and checked.
- (b) On arrival at the fixed line position No. 2 will mount the tripod. No. 2 will shine the torch on the bobbin whilst No. 1 positions the tripod over it by looking through the hole in the tripod head. Mount the gun.
- (c) No. 1 will fit the dial sight and will check that the dials are set at zero.

- (d) No. 2 will go forward with the aiming lamp and, having located the distant night line peg, will switch on the lamp and hold it directly behind the peg.
- (e) No. 1 will adjust the deflection and elevation drums on the tripod until the aim with the telescopic sight is laid through the near peg and on to the centre of the lamp. It may be necessary to move the tripod slightly.
- (f) When the aim is correct, carefully stamp in the shoes of the tripod and again check the aim. The section commander will also check the aim.
- (g) No. 2 will then be ordered to collect the pegs night line and set up the aiming lamp as previously taught. The section commander will order the No. 1 to adjust the elevation drum to the correct setting for the task. The elevation bubble will be centred by elevating (or depressing) the gun.
- (h) No. 1 will then lay an aim on the lamp as taught. The section commander will check the aim and elevation bubble. He will record all details. Order, "Load".

529. Practise the squad in pairs.

Completion of fixed line task

530. When the task has been completed, usually just before dawn light, the gun numbers will ensure that the conversion kit is repacked into the holdalls. The light barrel will be put back on the gun ready for use in the daylight role.

Conclusion

531. Questions from and to the squad.

532. Sum up.

LESSON 31—SECTION HANDLING—MOVEMENT AND DEFENCE

Aim

533. To teach the soldier:—

- (a) How the section is organized and equipped.
- (b) The duties in a section action.
- (c) The duties in defence.

Stores

534. As shown in para 536.

Notes

535. The man loads listed below are given as a guide and are considered to be an equal distribution of the load. They may be varied to suit the situation. The conversion kit and ammunition for the sustained fire role may be brought up to the section position, or it may have to be drawn from company HQ.

Man loads

536. Explain:—

The stores carried by:—

- (a) No. 1: GPMG with light barrel.
Small holdall.
One belt box—200 rounds.
Dial sight.

- (b) No. 2: Rifle and three magazines.
Tripod holdall.
Two belt boxes—400 rounds.

- (c) Another rifleman from the section will be detailed to carry:—
Aiming lamp.
Three belt boxes—600 rounds.

Method of carriage

537. Explain:—

The above loads give a reasonable distribution of weight for a short carry. They may be varied to suit individuals, but it must be remembered that the No. 1 will always be responsible for the gun and No. 2, the tripod.

Preliminaries

538. Safety precautions; each man checks his stores.

Approach

539. The knowledge learned as an individual must now be applied to handling within the team. The GPMG is used to give support to the platoon or company in both defence and attack. This lesson is concerned only with the drills and duties of the team in the attack, on reorganization after a successful action and in defence.

540. The team will now be equipped ready to move off.

Notes

- 541. (a) Previous to conducting this lesson the instructor must walk the ground over which he is to operate.
- (b) Supposed enemy positions must be selected and he should have decided on a simple tactical situation for each team.

(c) Positions for mounting the gun and tripod will also be selected, giving as wide a variety as possible.

(d) Once the lesson has begun, the instructor must take over two roles:—

- (i) As the instructor—checking faults.
- (ii) As the fire controller—indicating targets—correcting imaginary errors in range and direction, etc.

(e) One team only will be exercised at one time; the rest of the squad will be detailed as critics. They will be ordered to move with the team being exercised, but will not be so near that they cause obstruction.

Duties in a section action

542. (a) The team will be led by the section commander to a position where the gun is to be mounted. On the command, "Take cover", the team will get down behind the nearest cover.

(b) The section commander will call for the Nos. 1 and 2, and from a position of observation will indicate:—

- (i) The target to be engaged.
- (ii) The position of friendly forces.
- (iii) Paint a simple situation, depicting either support in attack, or plan for reorganization.

It must be made quite clear that the task is co-ordinated within the company fire plan.

(c) Section commander points out pre-selected position and orders the gun and tripod to be mounted. Checks the following points:—

- (i) Exposure during the mounting.
- (ii) That when mounted the tripod is level and that there is crest clearance.
- (iii) That the extra ammunition and aiming lamp have been delivered at the gun position and that the rifleman has taken up his fire position within the section.

(d) Section commander gives a fire control order and gives practice in corrections.

(e) Again checks faults.

Criticism

543. Question the remainder of the squad on the actions of the team.
544. Select another team, change the numbers round and continue practice on another piece of ground.

Conclusions

545. Questions from and to the squad.

546. Sum up.

LESSON 32—TESTING AND ADJUSTING THE DIAL SIGHT**TO BE TAUGHT TO ALL NCOs****Aim**

547. To teach how to test and adjust the dial sight.

Stores

548. Gun, tripod, dial sight, barrel level checking zero target at 25 metres range. Small screw-driver.

Approach

549. Give the aim of the lesson.

550. Explain:—

Dial sights will be tested and zeroed on issue and checked periodically.

Preliminaries

551. Order guns to be mounted. Zero both heavy barrels from a conversion kit to a gun.

Testing and adjusting for elevation

552. Explain and demonstrate:—

- Fit the dial sight.
- Check that the elevation scale and drum of the dial sight is set at zero.
- Insert the level, checking dial sight, down the gun muzzle as far as possible, with the bubble uppermost.
- Centralize the bubble, using the elevating gear. If the dial sight bubble is level, the sight is in adjustment for elevation.

- If the bubble is not central, rotate the sight elevation drum to centralize it.
- Loosen the three screws on the rear surface of the elevation drum and, holding the drum firmly, turn the scale ring so that "O" is in line with the zero mark. Tighten the screws and re-check that the bubbles are central.

Testing and adjusting for direction

553. Explain and demonstrate, using the zero target:—

- The target may be the normal white screen with one inch square black aiming marks. Select one aiming mark and draw a thick vertical line $3\frac{1}{2}$ inches to the left of the centre of the aiming mark.
- Check that both the deflection dial and drum are set at zero.
- Aim with the tangent sight at the centre of the aiming mark.
- Look through the telescopic sight. If the telescope is not in line, rotate the deflection drum until the aim is correct.
- If there is a right or left error, release the wing nut on the drum and rotate the scale ring so that "O" is in line with the inner zero mark. Position the hole in the wing nut over the screw heads and loosen the three screws, then rotate the outer ring until the outer zero mark, "O", on the scale ring and the inner zero mark are all in line. Check the aim through the tangent sight and the telescope and if both are correct, tighten the three screws. Tighten the wing nut.

Alternative test—direction only

554. The gun can be laid on a distant target with the tangent sight. If the telescopic sight also coincides with the target, it is in adjustment.

555. If the aim through the telescope does not coincide with the aim through the tangent sight on to the distant target, adjustment will be made as in para 553 (d) and (e).

556. Practise the squad.

Conclusion

557. Questions from and to the squad.

558. Sum up.

CHAPTER 5—TRAINING TESTS—SF ROLE

559. Soldiers under training should be tested by means of these training tests to find out if they have reached the required standard before going on to more advanced training.
560. The various tests should be inserted in the appropriate place in the training programme.
561. Tests are a suitable conclusion to the practice periods of the various basic lessons.
562. Before testing explain to the soldiers the test conditions. Let them ask questions. Once the test begins do not help them any more. Always tell them the results of the tests and where they went wrong.

Test No.	Subject	Stores	Conditions	Marking
1	Mounting gun and tripod.	Gun, tripod.	No. 1 and 2 standing beside their stores. Stores will be laid out not more than five yards from where the gun is to be mounted. Gun to be mounted in the lowest position on level ground. Time taken from command, "Mount gun", until both Nos. are in position: 25 seconds allowed.	All actions to be correct. 25 or less seconds 10 30 or less seconds 8 35 or less seconds 6 40 or less seconds 4 Over 40 seconds NIL Deduct one mark for each mistake. HPS 10
2	Loading, sightsetting and aiming.	Gun, tripod, belts, targets (landscape or natural).	Gun mounted, belt packed in belt box. No. 1 and 2 in position behind gun. Order, "Load", and indicate a target. No time limit. Aim to be checked for accuracy.	All points of drill to be correct. HPS 10. Deduct one mark for each mistake. HPS 10

TRAINING TESTS

Test No.	Subject	Stores	Conditions	Marking
3	Preparation for night firing.	Gun, tripod, belts. Aiming post and lamp. Dial sight, holdall.	Gun mounted before the test begins. Indicate a target. Order, "Prepare for night firing". No time limit. Check that aims on tangent and dial sight are correct and that the elevating bubble is central.	All points of drill to be correct. Allot 10 points to each number. Deduct one point for minor faults, two points for major faults. Change over and repeat the test. HPS 20
4	Stoppages.	Gun, tripod, belts, holdall.	Gun mounted before the test begins. Order, "Load", and indicate a target. Order, "Gun stops", and when the first drill has been completed, order, "Gun won't fire", followed by, "Breech block fully forward, cap not struck". The firer must clear the gun and change the recoil mechanism. Forty seconds from the order, "Won't fire", until the gun is firing again.	Two attempts out of three to be correct. 40 or less seconds 10 45 or less seconds 8 50 or less seconds 6 55 or less seconds 4 Over 55 seconds NIL Deduct one point for minor faults, two points for major faults. HPS 10

TRAINING TESTS

Test No.	Subject	Stores	Conditions	Marking
5	Changing barrels.	Gun, tripod, belts, holdall.	Gun mounted, loaded with one round only, target indicated and rapid fire ordered. Order, "Fourth belt expended". Fifteen seconds from that order until the barrel is changed and the gun is firing again.	All actions to be correct. Three attempts allowed, two to be correct. 15 or less seconds 10 17 or less seconds 8 19 or less seconds 6 21 or less seconds 4 Over 21 seconds NIL HPS 10

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Grade men as follows: Skilled — 52 to 60 marks
Above average — 44 to 51 marks
Average — 36 to 43 marks
Below average — 28 to 35 marks
Failed — Less than 28 marks

CHAPTER 6—RANGE COURSES

SECTION I—LIGHT ROLE

Introduction

563. The aim and principles of the Rifle Course apply equally to Light Machine Gun Courses, but owing to the weapon's characteristics, it is not possible to classify men fairly on single figure targets. Classification, therefore, will be fired on square targets until such time that electronic targets suitable for the gun become available. The superimposed Fig 12/59 is intended for use as an aiming mark only, the scoring area being the Bull/Inner and the Magpie/Outer.

Recruits

564. Whilst at his depot the infantry recruit will fire Practices 1 to 5 as an Instructional Course and 2 to 5 and 7 for Classification (ie, All officers, WOs, NCOs and men (except those exempted)).

Trained soldiers

565. Practices 1, 2 and 4 to 6 will be fired as Instructional.

Practices 2 to 7 fired as Classification.

Classification standards

566. Recruits — Marksmen: 150, 1st Class: 125, 2nd Class: 100, 3rd Class below 100.
Trained Soldiers — Marksmen: 170, 1st Class: 145, 2nd Class: 120, 3rd Class below 120.

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No.	Practice	Target	Range in Metres	Rounds	Position and Firer's Instruction	Scoring	Range Instructions
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	Grouping.	2 x 4 ft. targets. For details see Note 1.	100	20	1. Lying in the open. 2. To be fired in bursts of 4 to 5 rounds. 3. One burst at each aiming mark.	Size of each group to be recorded.	1. Firers to examine each group. Errors in holding will be discussed. 2. Guns must be zeroed before commencing Prac 2.
2	Deliberate	1 x 4 ft. target. For details see Note 2.	300	30	1. To be fired from a trench, If not available, fire in the open. 2. Ammunition will be in two belts—10 and 20 rounds. 3. The practice to be fired in bursts of 4 to 5 rounds.	Bulls and Inners, 2 points. Remainder of target, 1 point HPS 40	1. Ten rounds in two bursts will be fired at a group of four falling plates for registration. 2. One belt of 20 rounds will be fired at the 4 ft target in bursts of not less than four rounds. 3. No time limit.

No.	Practice	Target	Range in Metres	Rounds	Position and Firer's Instruction	Scoring	Range Instructions
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
3	Timed Rapid.	1 x 4 ft target as for Prac 2.	300	25	1. To be fired in the open. 2. One belt of 25 rounds, fired in bursts of 4 to 5 rounds.	Scoring as for Prac 2. HPS 50	1. No. 1 lying in position 10 metres behind firing point Order, "Make safe". 2. On appearance of target move to firing point and engage target. 3. One exposure of 20 seconds.
4	Deliberate	1 x 4 ft target as for Prac 2.	400	20	1. To be fired in the open. 2. One belt of 20 rounds, fired in bursts of 4 to 5 rounds.	Scoring as for Prac 2. HPS 40	1. The MPI of each burst will be signalled. 2. No time limit.

No.	Practice	Target	Range in Metres	Rounds	Position and Firer's Instruction	Scoring	Range Instructions
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
5	Deliberate	1 × 6 ft target. For details see Note 3.	500	20	As for Prac 4.	Scoring as for Prac. 2. HPS 40	As for Prac 4.
6	Deliberate	1 × 6 ft target as for Prac 5.	600	20	As for Prac 4.	Scoring one point per hit. HPS 20	As for Prac 4.

No.	Practice	Target	Range in Metres	Rounds	Position and Firer's Instruction	Scoring	Range Instructions
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
7	Timed Fire and Movement.	1 × 4 ft target as for Prac 2.	600 to 300	15	Phase 1 1. Lying in the open at 600. On the appearance of the target run to the target and fire 500 and fire 15 rounds in bursts. 2. When the target disappears, make safe with the second belt of 15 rounds. Phase 2 1. On the appearance of the target, run to 400 and fire 15 rounds in bursts 2. When the target disappears, make safe with the third belt of 20 rounds.	Scoring as for Prac 2.	Phase 1 1. One 4 ft target to be exposed for 45 seconds on signal from firing point. 2. An interval of 15 seconds will be allowed between target exposures of each phase. Phase 2 One 4 ft target to be exposed for 45 seconds.

No.	Practice	Target	Range in Metres	Rounds	Position and Firing Instruction	Scoring	Range Instructions
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
7 cont.				20	Phase 3 On appearance of the target, run to 300 and fire 20 rounds in bursts.	HPS 50	Phase 3 One 4 ft target to be exposed for 45 seconds.

Notes: 1. For Practice 1 targets as used for rifle grouping practices will be used.

2. For Practices 2 to 4 and 7 the target will be a 4 ft with ochre background and Fig 12/59 superimposed with the centre of the figure on the centre of the 4 ft.

3. For Practices 5 and 6 the target will be a 6 ft coloured ochre with a Fig 12/59 superimposed.

Total Recruits 260
Total Trained Soldier 275

HPS Recruits 220
HPS Trained Soldier 240

SECTION II—SF ROLE—PART I

Introduction

567. (a) The 25-metre range course consists of five practices, designed to exercise gun numbers in the drills and skills taught in the sustained fire role.
- (b) Practices should be fired as soon as possible after the relevant lesson has been taught, eg, when Lesson 15, "Engaging point targets", has been taught and practice given, Practice 2 of the 25-metre range course should be fired.
- (c) Trained soldiers will fire the course annually and qualifying standards will be set to ensure that he is competent in all his duties as a member of the gun team.
- (d) Recruits will not qualify, but a record should be kept of his results and forwarded with his documents to his battalion. This record will assist in the selection of the best gun numbers.
- (e) The use of the gun in the sustained role requires the soldier to learn new drills and techniques. Every opportunity should be given to practise these drills throughout the year, particularly with those men who show a greater aptitude in the use of the dial sight, night preparation, etc.

Training of fire controllers

568. (a) If the sustained fire gun is to be used to the best advantage, fire control must be efficient. This can only be achieved by constant practice being given to all NCOs. Lessons on this subject are included in the pamphlet; they must be taught prior to the firing of Part I Range Course.
- (b) Practice in fire control. The instructor should have a replica of the landscape on the harmonised screen and, using a pin, will indicate the target to be engaged. If it is a target with width or depth, he will put a pin at each end of the target. The NCO giving the fire order will, on completion of the engagement of the target, be criticized, but this should not be done within the hearing distance of the gun numbers.
- (c) This form of training is valuable at this stage in the practice of the correct sequence of fire orders and the indication of targets by the various methods that have been taught.

Ammunition

569. (a) It is anticipated that an allotment of 200 rounds per man per year only will be available for this course. In order to increase the number of practices, the length of burst has been reduced.
- (b) It is not necessary to engage the whole length of a wide traversing target at this stage of training.

Qualification tests

570. The aim of the Range Course, Part I is to "qualify gun numbers in handling the GPMG in the sustained fire role."

571. Officers and NCOs conducting the range practices must be guided by the methods of scoring laid down as set out below. Points will be deducted according to the degree of error. Minor errors deduct one point, major errors, two or more.

572. It is not possible to list the many errors which can be made by gun numbers. The test must be conducted fairly, eg, where a fault in gun drill is observed which does not affect the over-all success of the practice, the man will be told of the fault, but need not necessarily lose marks.

573. To qualify, the man must obtain 120 points.

Method of scoring

574. (a) Practice 2—point target HPS 30

Score

- (i) Correct recognition of the target 10
- (ii) Correct point target drill 10
- (iii) Points of training... .. 10

(b) Practice 3—traversing target HPS 30
Score as in Practice 2.

(c) Practice 4—obscuration of target HPS 40

- (i) Correct recognition of the target 10
- (ii) Action on command, "Stop" 5
- (iii) Correct adjustment of dial sight 10
- (iv) Correct aim—telescopic sight 5
- (v) Points of training... .. 10

(d) Practice 5—preparation for night firing HPS 50

- (i) Correct recognition of the target 10
- (ii) Correct adjustment of dial sight 10
- (iii) Correct aim—telescopic sight 10
- (iv) The engagement of the target 10
- (v) Points of training... .. 10

Total points 150

TO BE FIRED ON THE 25 METRES RANGE

NOTES: 1. The practice in Part I should be fired practice by practice as the appropriate stage of training is reached.
2. Landscape targets on the harmonized screen should be changed over frequently so that Fire Controllers are given a greater variety of targets.

Practice No.	Practice	Target	Rounds	Detail	Remarks
1	Application of service bursts.	White screen with 1" black aiming marks.	30	<p>Aim: To give the firer further practice in the application of service bursts.</p> <p>1. Rounds will be in three belts of 10 in each.</p> <p>2. The firer will engage three aiming marks.</p> <p>3. All drills of loading, etc, will be carefully noted. The firer will be criticised for mistakes at the conclusion of the practice.</p>	<p>1. This practice should be fired as soon as the firer has been taught Lesson 25.</p> <p>2. It should be explained that this is not the service burst, but is used to conserve ammunition.</p>

Practice No.	Practice	Target	Rounds	Detail	Remarks
2	Harmonization Point targets.	Harmonized screen. For details see IT Vol III, Pamphlet No. 32 Range Construction and Regulations, Section 15	50	Aim: to practise the firer in the drill for engaging point targets. 1. Harmonization of sights will be carried out before this practice begins. 2. The gun will be loaded and set at the harmonized range. 3. A target will be indicated to the firer. 4. Five 10-round bursts will be fired at each target.	
3	Harmonization traversing targets.	As for Practice 2.	70	Aim: to practise the firer in the drill for engaging traversing targets. 1. One traversing target of about three clicks right and left will be indicated. 2. As for Practice 2. 3. As for Practice 2.	The MPI of each burst will be about four and a half inches apart. This practice should be repeated if ammunition is available.

Practice No.	Practice	Target	Rounds	Detail	Remarks
4	Obscuration of target drill.	As for Practice 2.	20	Aim: to practise the Nos. 1 and 2 in prolonged obscuration drill, as follows:— 1. A point target will be indicated and engaged with one burst. 2. The order, "Stop", will be given. 3. The order, "Unload—Clear guns", will now be ordered. 4. Gun numbers will now be ordered, "Prepare for prolonged obscuration". 5. When all No. 2s are back on the firing point, order, "Load—Lay", followed by, "One burst—Fire".	1. In order to give practice to No. 2. The aiming lamp will be put out. 2. The firing point officer must ensure that all guns are clear before the No. 2s are permitted to move forward. 3. When the aim has been laid on the aiming lamp, the gun will be released and swung away from the target and the tangent sight lowered. 4. Instructors must watch the screen during the firing of each burst, in order to detect errors between each.

Practice No.	Practice	Target	Rounds	Detail	Remarks
5	Preparation for night firing.	As for Practice 2.	10	<p>Aim: to practise the Nos. 1 and 2 in the preparation for engaging two targets at night.</p> <ol style="list-style-type: none"> 1. Order guns and tripods to be mounted. 2. Using the replica landscape, indicate one point and one traversing target to the section commander. 3. Order, "Prepare night tasks". 4. When all teams are ready, order, "Load". 5. Adjust the dial sight to zero and swing the gun slightly away from the target. 6. Order, "Engage target 'A' (or 'B')". ONE BURST only will be fired. 7. Order, "Unload — Clear guns", and move to harmonized screen to check accuracy. 	Traversing and point targets will be selected prior to the commencement of the practice.
		Total, Part I	180		

SECTION III—SF ROLE—PART II

Aim

575. The aim of this course is twofold:—

- (a) To complete the training of NCOs as fire controllers.
- (b) To give further practice to gun teams on the field firing range.

Ammunition

576. The allotment of ammunition for Part II is expected to be about 600 rounds per section only. It is important that the ammunition is used intelligently, in order to make the best use of it. If strike can be observed at ranges greater than the range where the tracer burns out, there is no need to waste ammunition by engaging the whole width of a traversing target. At ranges of 1,100 metres or less the rule must always be "to stop firing when it can be seen that the tracer is falling on the target". The length of the burst must be reduced whenever possible.

Training NCOs

577. The fire controller is the key man. If he cannot indicate targets, or correct errors in elevation, or prepare night tasks, he is useless as a section commander. Officers conducting this course must plan and prepare fire tasks with a tactical picture always in mind. The NCO must be given the task before the target is pointed out, eg, the position of the enemy and friendly forces; why the task is required, whether it is in defence or in support.

Training of gun numbers

578. A minimum of 50% of the section must be employed as gun numbers on this course. Some men will learn the drills quite quickly. With some, however, extra practice will be required. There will be a tendency to select only the best men to fire the guns on field firing ranges. This should be avoided if possible.

Criticism

579. Errors made by the gun numbers should be criticized immediately. NCOs should be criticised on completion of the task, unless it is seen that the task is likely to be unsuccessful. In this event, the gun numbers should be sent away from the gun whilst the NCO is being corrected.

TRAINING TESTS

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No.	Practice	Approximate Range	Rounds	Sec Comd's Instructions	FPO Details
1	Engaging a point target.	900	50	Aim: To practise NCOs in observation of fire and ranging 1. A supposed enemy gun position will be pointed out. 2. The NCO will be ordered to engage the target.	1. Any errors made by the NCO and the gun numbers will be carefully noted. 2. When the first effective burst falls on the target, the Firing Point Officer will order, "Stop". 3. Criticize the team.
2	Engaging a depth target.	Near end 800 Far end 1,000	140	Aim: To practise NCOs in the engagement of depth targets. 1. A supposed enemy position will be pointed out. 2. The NCO will be ordered to engage the target, as detailed at Note 2 in Detail column.	1. The target selected must be narrow, ie, engaged as a point target. 2. In order to conserve ammunition, when the target has been fully engaged at the first elevation, the first burst at each subsequent elevation only will be fired. 3. Criticize the team.
3	Obscuration of the target.	1,000	60	Aim: To practise the NCO and gun team in obscuration drill.	1. As a safety precaution aiming posts can be put out in position before the practice begins.

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No.	Practice	Approximate Range	Rounds	Sec Comd's Instructions	FPO Details
3 cont.				1. A supposed enemy position will be pointed out. 2. The NCO will be ordered to engage the target. 3. When it is observed that the target is being successfully engaged, he will be given the order, "Target becoming obscured by smoke". 4. The NCO will then give the necessary orders to the gun team.	2. When the obscuration drill has been completed, the dials on the sight will be set at zero and the gun swung away from the target. 3. The order will then be given to, "Engage the target". 4. It is important that the strike of the shots should be observed prior to and after the obscuration drill.
4	Rapid engagement of targets.	1st target 1,000 2nd target 800	50 50	Aim: To practise the NCO and the gun numbers in the rapid engagement of targets. 1. The NCO will be ordered to engage an enemy position. 2. Whilst the target is being engaged he will be ordered to direct fire to a target at a closer range.	1. The first target should have width and, if possible, should be on sloping ground. 2. The second target should be a point target—such as an enemy gun position. 3. When the beaten zone is seen to fall on the first target the Firing Point Officer will order, "Stop".

No.	Practice	Approximate Range	Rounds	Sec Comd's Instructions	FPO Details
4 <i>cont.</i>					4. He will then point out the second target to be engaged. 5. The time limit of one minute will be imposed.
5	Preparation for night firing.	From 700 to 1,000.	50 for each target (3)	Aim: To practise the NCO and gun numbers in the day-light preparation of night tasks. 1. The NCO will be given three targets, varying in range from 700 to 1,000 metres. 2. The range to each target will be given. 3. He will be ordered to prepare to engage all three tasks. 4. He will report the completion of the tasks to the Firing Point Officer.	1. Prior to conducting this practice, the targets must have been selected and the ranges obtained by rangefinder or other means. 2. When the NCO reports that the tasks are completed, the Firing Point Officer will direct fire to be brought down on each target in turn. 3. Careful observation of fire will be necessary to check on fire effect.
			Total	500	

SECTION IV—TRAINING—SECTION COMMANDERS

580. This is divided into two stages:—

- Lessons and practice in fire control.
- Further practice on Range Course, Part I.

With regard to (a):—

Practice must be given on all types of targets on varying areas of ground up to ranges of 1,500 metres. The targets selected must be entered on range cards, the ranges having been taken by a rangefinder. Instructors must always insist on correct sequence and the fire order will be criticized for other errors.

With regard to (b):—

The introduction to the Range Course, Part I, page 138 lays down the method of practising NCOs. Full value must be made of the course. Providing the two stages of training have been carried out correctly, the NCO is now ready to be put through his qualification test.

Qualification tests

581. There are two qualification tests:—

- Range Course, Part II.
- Fire control problems.

The range course is set out in Section III. It is conducted on a Field Firing Range, where practical work can be done using ball/tracer. Observation of strike and the application of the beaten zone on the target can now be practised. Officers conducting the tests will decide whether the fire tasks have been completed successfully.

Method of scoring

582. Points will be awarded as follows:—

	Points
(a) Clear indication of the target	10
(b) Correct sequence	5
(c) Correct wind allowance	5
(d) Fire effect	10
(e) Correct recording of dial sight adjustments (when used)	10
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Points will be deducted for mistakes. If the mistake is a bad one, deduct two or more; if small, deduct one.

Qualification standards

583. First class	130
Second class	110
Failed—below	110

The results obtained on the above are carried forward to the second part—Fire Control Problems.

SECTION V—HARMONIZATION

Introduction

584. Before conducting Range Course, Part I, it will be necessary to harmonize the guns.

Targets

585. For details see Infantry Training Vol. I, Pamphlet No. 12, page 21, Appendix "A".

Harmonization of sights

586. In firing at landscape targets, weapons should be given sufficient elevation to ensure that the bullets will strike the sky screen, even if the aim is on a target at the bottom of the landscape. This extra elevation necessitates the weapons being harmonized in order that they all shoot at the same height above the point aimed at. Harmonization is carried out as follows:—

- (a) Set the tangent sight at 1,400. Lay on one of the aiming marks and fire a short burst.
- (b) Move the sight up or down until the shots strike between the two lines.
- (c) The elevation of each gun should be recorded.

Apparatus and method of scoring

587. (a) Point targets

A measuring rod 27 inches in length is required and it will be used as follows:—

- (i) Hold the rod vertically with the bottom positioned on the point of aim.
- (ii) Mark the screen at the top of the rod; this indicates where the MPI should be.
- (iii) A wire rectangle $7\frac{1}{2}$ inches by 4 inches will be placed with its centre on the mark, the longest side horizontal. All shots in the rectangle will count two points. Nil for those outside.

(b) Traversing targets

- (i) Mark the limits of the target as for the point target.
- (ii) Join the two marks with a pencil, extending it one and a half inches at each end.
- (iii) Draw a line two inches both above and below the first line. The ends are joined by vertical lines.
- (iv) Count one point for each hit inside the rectangle—nil for those outside.

- (c) A miniature replica of the landscape target in use should be available on the firing point. The instructor will indicate the target to be engaged by inserting pins. The NCO being practised, having identified the target on the landscape, will give the fire order. The order should be given from a firing position without further reference to the replica.

